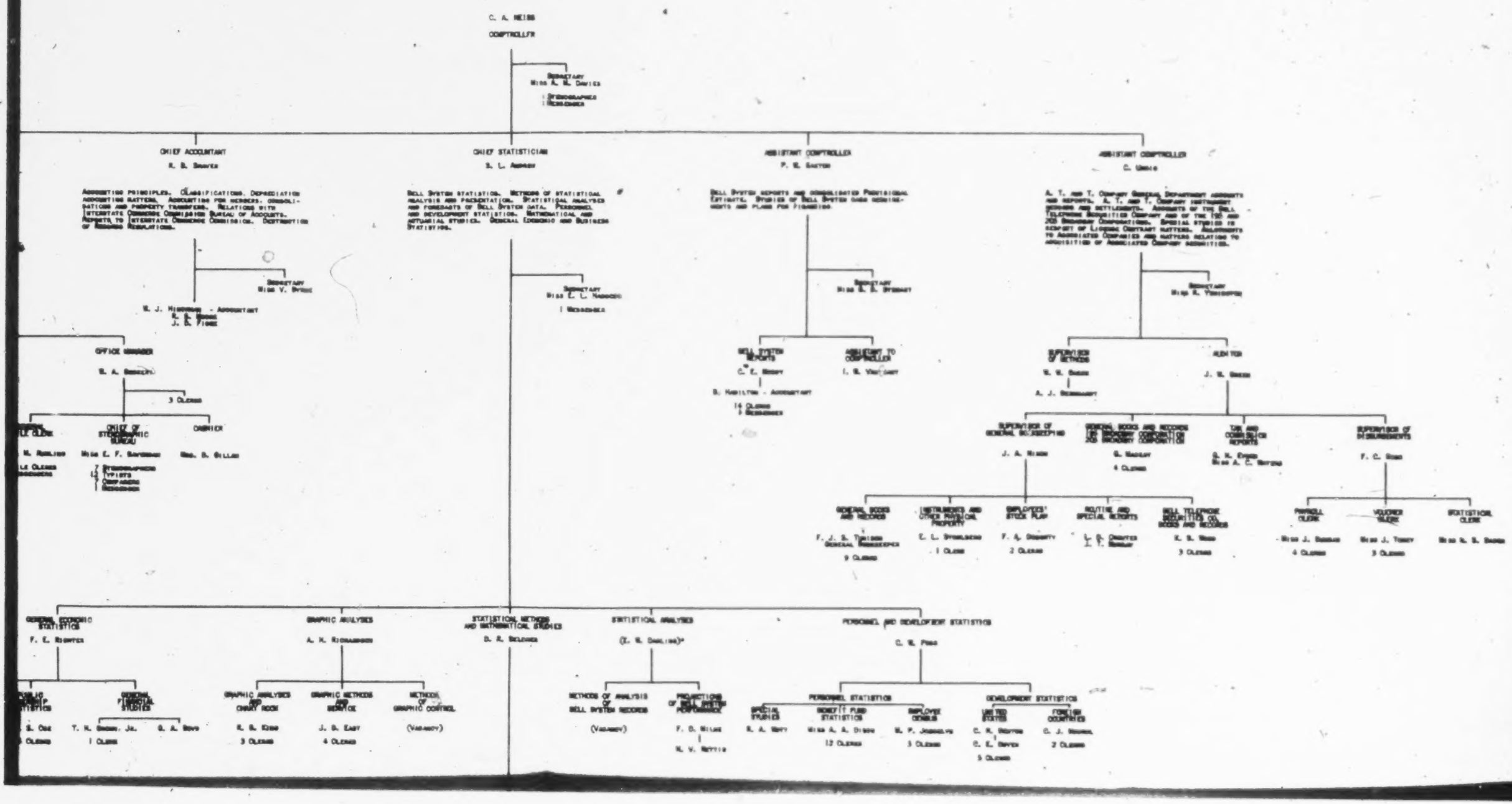
TOLL CASE CRUNDEN EXHIBIT 2

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

COMPTROLLER'S DEPARTMENT

- DECEMBER 1, 1923 -



COMPTROLLER

Secretary
Miss A. M. Davies
1 Stenographer
1 Messenger

CHIEF ACCOUNTANT
R. B. Sawyer

Accounting principles, classifications, depreciation accounting matters. Accounting for mergers, consolidations and property transfers. Relations with Interstate Commerce Commission Bureau of Accounts. Reports to Interstate Commerce Commission. Depositories of Records Regulations.

Secretary
Miss V. Dyson

R. J. Hirshman - Accountant
E. E. Grace
J. E. Fiske

OFFICE MANAGER
E. A. Bennett

3 Clerks

Chief of Statistical Bureau
Miss C. F. Sandman

7 Stenographers-Typists
Comptometer Operators
Messengers

Chapter
Mrs. D. Gillis

CHIEF STATISTICIAN
S. L. Andrew

Bell System statistics. Methods of statistical analysis and presentation. Statistical analyses and forecasts of Bell System data. Research and development statistics. Mathematical and actuarial studies. General economic and business statistics.

Secretary
Miss E. L. Hargrove
1 Messenger

ASSISTANT COMPTROLLER
F. W. Saxton

Bell System reports and consolidated Provisional Estimate. Studies of Bell System cash requirements and plans for financing.

Secretary
Miss K. E. Stewart

Bell System Reports
C. E. Moody

E. Hamilton - Accountant
14 Clerks
1 Messenger

Assistant to Comptroller
I. H. Van Sant

ASSISTANT COMPTROLLER
C. Umlo

A. T. and T. Company General Department accounts and reports. A. T. and T. Company instrument records and installments. Accounts of the Bell Telephone Securities Company and of the 195 and 205 Broadway Corporations. Special studies in respect of License Contract matters. Adjustments to Associated Companies and matters relating to acquisition of Associated Company securities.

Secretary
Miss E. Yerington

Supervisor of Methods
W. H. Rowe

A. J. Rosenquist

Auditor
J. H. Bacon

Supervisor of General Accounting
J. A. Wilson

General Books and Records of Property Companies and Property Companies
G. Mackay
4 Clerks

Tax and Commission Reports
E. M. Dyer
Miss A. C. Bryson

Supervisor of Disbursements
F. C. Ross

General Books and Records
F. J. S. Tobias
General Bookkeeper
9 Clerks

Instruments and Other Physical Property
E. L. Stoneback
1 Clerk

Employees' Stock Plan
F. A. Doherty
2 Clerks

Routine and Special Reports
L. P. Chester
J. T. Bailey

Bell Telephone Securities Co. Books and Records
E. S. Wise
3 Clerks

Payroll Clerk
Miss J. Dubbs
4 Clerks

Voucher Clerk
Miss J. Tobey
3 Clerks

Statistical Clerk
Miss M. S. Bowles

General Economic Statistics
F. E. Richter

Public Utility Statistics
S. Ost
3 Clerks

General Financial Studies
T. N. Brown, Jr.
1 Clerk

S. A. Boyd

Graphic Analyses
A. K. Richardson

Graphic Analyses and Chart Room
R. B. Kline
3 Clerks

Graphic Methods and Service
J. D. East
4 Clerks

Methods of Graphic Control
(Vacancy)

Statistical Methods and Mathematical Studies
D. R. Belcher

Analyses of Business Statistics and Correlation Studies
(E. H. Ahl)*
R. M. Flinn
7 Clerks

Fire Insurance
E. D. Read

Actuarial Analyses
S. H. Wiedbrock
O. C. Richter
3 Clerks

General Mathematical Analyses
F. B. Rabbitt
B. E. Dunlap

General Library
Miss M. Dell, Bell Librarian
3 Clerks
1 Messenger

Divisional Routine
Miss M. T. Sullivan
Chief Clerk
4 Stenographers
3 Messengers

Statistical Analyses
(E. H. Darling)*

Methods of Analysis of Bell System Records
(Vacancy)

Projections of Bell System Performance
F. O. Wilke
R. V. Reville

Personnel and Development Statistics
C. W. Pike

Personnel Statistics
Special Studies
R. A. Neff

Benefit Fund Statistics
Miss A. A. Dixon
12 Clerks

Employee Credits
M. P. Josselyn
5 Clerks

Development Statistics
United States
C. R. Boynton
C. E. Dwyer
5 Clerks

Foreign Countries
G. J. Rowell
2 Clerks

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[fol. 15315] TOLL CASE—CRUNDEN EXHIBIT 11

A. U. R. P. 124

Filed Feb. 28, 1924

American Telephone and Telegraph Company

List of Accounting Circulars and Bulletins Issued by the Comptroller's Department for the Information and Assistance of Associated Bell Telephone Companies

[fol. 15316]

Accounting Circulars

Number	Date Issued	Subject
8	1- 1-13	Standard Telephone Accounts.
8B	3- 3-13	Additions and Minor Changes.
8C	4- 8-14	" " " "
8D	6- 3-14	Employees' Benefit Fund Accounting.
8E	1-22-15	Standard Telephone Accounts (Supplementing Accounting, Circular No. 8).
8F	12-15-20	Standard Telephone Accounts (Supplementing Accounting Circular No. 8).
9	12-28-12	List of Circular No. 6 Accounts and Corresponding Circular No. 8 Accounts.
10	3-26-13	Standard Accounting Treatments.
10A	3-30-17	Standard Accounting Treatments (Supplementing Accounting Circular No. 10).
12	7- 1-16	Questions and Answers.

Accounting Bulletins

1A	5- 6-09	Accounting Bulletins.
2C	1-29-13	Field Code for Plant and Maintenance Accounts.
3C	3-29-13	Accounting for Station Equipment.
4C	10- 1-20	Estimates, Forms and Records.
5B	5-15-13	Vouchers.
6B	5-15-13	Detail Distribution.
7B	6- 3-13	Employees' Working Advances.
8B	5-15-13	Office Furniture and Fixtures.
9B	5-15-13	General Tools and Implements.
10B	5-15-13	General Stable and Garage Equipment; Stable and Garage Expense.
11B	6- 3-13	Office Supplies.
12B	5-20-13	Plant Supplies.

Accounting Bulletins—Continued

Number	Date Issued	Subject
12B-1	1- 7-14	Plant Supplies.
12B-2	12- 7-14	Plant Supplies.
12B-3	2-10-16	Plant Supplies.
13B	5- 8-13	Time Records and Payrolls.
14C	2- 8-13	Analysis of Debit Subaccounts of Reserve for Accrued Depreciation.
15D	12-28-15	Telegrams Telephoned—Class 1, 2, 3 and 11B Offices.
16D	1-23-15	Record of Officers and Certain Employees of Bell Telephone System.
17A	12-15-11	Bills Against Subscribers.
18A	12-15-11	Subscribers' Ledgers and Revenue Summaries.
19A	12-15-11	Subscribers' Final and Suspended Accounts.
20A	12-15-11	Company Attended and Automatic Public Pay Stations.
21A	12-15-11	Automatic Public Pay Stations.
22B	12-20-13	Toll Billing.
24A	12-15-11	Measured Service Billing.
[fol. 15317]		
25B	6-21-13	Telephone Service in Return for Rights and Privileges.
26B	4- 5-13	Instruments of the American Bell Telephone Company.
28B	10-15-13	Telegrams Telephoned—Class 12, 13, 14 and 15 Offices.
33A	12- 4-12	Application of Plan for Employees' Pensions, Disability Benefits and Insurance.
35A	6-25-13	Records for Instruments of the American Bell Telephone Company.
—	(Annually)	Federal Income Tax Requirements.
40A	4- 9-14	Accounting for Qualified Toll Service—Subscribing Telephone Companies.
42B	1-14-20	Application of Second Stock Purchase Plan of American Telephone and Telegraph Company for Bell System Employees.
42C	7- 1-21	Application of Employees' Stock Plan, Dated May 1, 1921.

Accounting Bulletins—Continued

Number	Date Issued	Subject
42C-1	4-15-22	Supplementing Accounting Bulletin 42C.
43A	12-29-15	Financial Department Records.
43A-1	2-28-16	" " " —Bond Coupon Records.
44A	5- 6-16	Protection of Toll Revenue.
45B	4- 7-17	Military and Naval Service.
47A	6-11-17	Records of Securities.
48A-4	5-19-19	Victory Liberty Loan Notes.
49B	8-14-19	United States Government Tax on Telephone Messages and Special Facilities.
50A	6- 6-18	Company Custody of Employees' Liberty Loan Bonds.
51A	1- 1-20	Uncollected Toll Charges at Public Telephone Stations.
52A	12-15-20	Overhead Expense.
53A	5-15-21	Auditing and Recording Cash Collections and Deposits.
54A	1- 1-22	Settlement Summaries and Statements for Long Lines Toll Revenue.
102B	5- 8-11	Standard Forms—Bell Telephone System.
103B	12-31-12	Standard Station Classifications.
104A	12-31-10	Standard Definitions.
104A-1	3-15-11	Standard Definitions.
104 -2	3- 7-12	Standard Definitions (Minor Changes).
105C	5-18-17	Mailing or Delivering Subscribers' Bills.
107A	1-16-12	Typical Organization of an Accounting Department in a Large Operating Telephone Company.
108A	9- 1-17	Standard Occupational Classification of Telephone Employees.

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Accounting Letters

Index of Titles—"A" Letters

A- 1	1-18-22	Compilation of Reports to Interstate Commerce Commission.
A- 2	3- 6-22	Accounting for Revenues and Expenses in connection with Property carried in Account 111—Miscellaneous Investments.

Index of Titles—"A" Letters—Continued

Number	Date Issued	Subject
A- 3	6-12-22	Accounting for Credits issued by Western Electric Co., Inc., on freight claims allowed by carriers on overcharged shipments.
A- 4	6-21-22	Classification as between Construction and Operation of Commercial Department Expenditures on Commercial Surveys.
A- 5	6-28-22	Period of time after which certain Expenditures for construction carried in Account 104—Construction Work in Progress, must be cleared from that account.
A- 6	8- 2-22	Account 707-08 House Service Expense—Special Rearrangements.
A- 7	8- 4-22	Accounting for Expenditures Chargeable to Account 104—Construction Work in Progress.
A- 8	11-22-22	Classification of Pay and Expenses of Chief Traveling Auditor and Traveling Auditors.
A- 9	11-23-22	Enclosing letter regarding Accounting for Toll Commissions and for Certain Facilities and Services furnished by one Company to another.
A-10	12- 7-22	Accounting for Expenditures incurred in connection with Public Switchboard Demonstrations.
A-11	2-14-23	Accounting for Amounts received for space leased to Others in Building partly Occupied by the Telephone Company when House Service is Furnished.
A-12	3-29-23	Accounting for Investment and Expenses in connection with Public Address System Equipment and Radio Broadcasting Equipment.
A-13	5-21-23	Accounting for Commercial Department Cash Overages and Shortages.
A-14	9-27-23	Accounting for Revenues Subject to Possible Refund Pending Rate Investigations.

Index of Titles—"A" Letters—Continued

Number	Date Issued	Subject
A-15	10-29-23	Classification of Cost of Inspection of Plant.

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A-16	11-22-23	Accounting for Going or Completed Plants Purchased.
A-17	1-23-24	Pricing of Non-Standard Reusable Material Returned to Class "C" Stock.
A-18	2- 5-24	Classification of Cost of Removing Drop Wires.

[fol. 15320] Index of Titles—"M" Letters

M- 1	1-19-22	Method for Establishing and Maintaining Reserve for Uncollectible Accounts.
M- 1-1	10-20-22	Uncollectible Operating Revenues. (See "M"-8.)
M- 2	1-19-22	Accounting Stub Plan—Filing Equipment. (See "M"-16.)
M- 3	1-20-22	Review of Burglary and Hold Up Insurance—Bell System.
M- 4	2-14-22	Elimination of Stamps—First Class Mail.
M- 4-1	4-26-22	Postage Meter Machines—"Statement of Mailing" Registers.
M- 5	2-14-22	Accounting procedure involved in Standard Commercial Practice relating to Service Orders. Billing and Collections for Telephone Service to U. S. Army.
M- 5-1	6-26-22	Accounting procedure involved in Standard Commercial Practice relating to Service Orders. Billing and Collections for Telephone Service to U. S. Army.
M- 6	2-15-22	Ventilation of Offices.
M- 7	2-21-22	Binders for Controlling Records.
M- 8	3- 6-22	Uncollectible Long Lines Toll Messages.
M- 9	2-21-22	Subscribers' Bills—Fractional Charges and Credits.

Index of Titles—"M" Letters—Continued

Number	Date Issued	Subject
M- 9-1	10-30-22	Subscribers' Bills—Fractional Charges and Credits.
M-10	2-23-22	Controlling Records—Transferred Accounts.
M-11	3- 7-22	Elimination of Stamps—First Class Mail.
M-12	4-17-22	Telephone Subscribers' Bills—Standardization of Paper Stock and Perforations.
M-13	5- 6-22	Reporting U. S. Tax on Telephone Messages.
M-14	5-15-22	Mailing Subscribers' Bills as Third Class Matter.
M-15	5-23-22	Abbreviations for Toll Purposes.
M-15-1	7- 5-23	Abbreviations of Cities and Towns for Toll Work.
M-16	5-23-22	Accounting Stub Plan Equipment—Guide Cards.
M-17	5-31-22	Correction of Collect Tickets.
[fol. 15321]		
M-18	6- 9-22	Method of Preparing Standard Commercial Department Collection Report.
M-18-1	11-10-22	Commercial Department Collection Report.
M-19	6- 1-22	Assignment of Form Numbers.
M-20	6-19-22	Fidelity Bonds—Reduction in Rates.
M-21	6-27-21	Changes in Application of Report Charges.
M-22	7- 3-22	Telegrams Telephoned.
M-23	7-10-22	Messenger Service Revennes.
M-24	7-28-22	Overcharges on Freight Shipments of Telephone Material.
M-25	8- 1-22	Methods of Checking W. E. Bills and Credits.
M-25-1	1- 2-23	Methods of Checking W. E. Bills and Credits.
M-26	8-10-22	Method of Estimating Unbilled Additional Local Message Revenue (Monthly Settlement Plan).

Index of Titles—"M" Letters—Continued

Number	Date Issued	Subject
M-27	8-21-22	"Equated Production Unit" Method of Measuring Revenue Accounting Costs.
M-27-1	4-25-23	Analysis of Revenue Accounting Costs.
M-27-2	8- 8-23	Analysis of Revenue Accounting Costs.
M-28	8-23-22	Estimated Toll Service Revenues.
M-29	9-22-22	Retirement Unit Costs for Station Equipment.
M-30	10-27-22	Standard Controlling Records and Summaries.
M-31	12- 7-22	Telephone Subscribers' Bills and Envelopes—Recommended Standards.
M-31-1	1-25-24	Telephone Subscribers' Bills.
M-32	11-14-22	Accounting Department Record of Important Transactions.
M-33	12- 9-22	Estimate of Intercompany Toll Settlements—Receivables and Payables.
M-34	3- 6-23	Accounting Circular 8F and Accounting Bulletin 52A—Overhead Expense.

[fol. 15322]

M-35	4- 6-23	Preparation of Addressograph Plates.
M-36	5- 1-23	Recording and Accounting for Subscribers' Deposits.
M-37	5-15-23	Measured Service and Billing.
M-38	7-18-23	Coin Box Public Pay Station Accounting.
M-39	9-14-23	Toll Billing—Record of Tax Register Readings.
M-39-1	9-24-23	Toll Billing—Equipment and operation of Toll Billing Typewriters.
M-39-2	12- 6-23	Toll Billing Desks.
M-39-3	1-23-24	Toll Billing—Proper Cutting of Toll Service Statements.

(Here follows 1 paster, side folio 15323)

[Vol. 15323]

TOLL CASE—CRUNDEN EXHIBIT 12

Illustration of Method of Determining Annual Depreciation Expense

Class of Property (1)	Cost (2)	Average Service Life Years (3)	Gross Salvage (4)	Cost of Removal (5)	Net Salvage Amount (6)	Net Salvage % of Col. 2 (7)	Property Cost Used Up Amount (Col. 2 − Col. 6) (8)	Property Cost Used Up % of Col. 2 (9)	Annual Depr. Rate Per Cent (Col. 9 + Col. 3) (10)	Annual Depreciation Expense (Col. 2 × Col. 10) (11)
Buildings	$82,000	25	$28,700	$.....	$28,700	35	$53,300	65	2.6	$2,132
Central Office Equip	196,000	10	47,040	7,840	39,200	20	156,800	80	8.0	15,680
Station Apparatus	78,000	4	23,400	.....	23,400	30	54,600	70	7.5	5,850
Private Branch Exchanges	32,000	8	12,800	1,600	11,200	35	20,800	65	8.1	2,592
Booths	4,000	11	680	200	480	12	3,520	88	8.0	320
Exchange Pole Lines	67,000	10.5	.....	.....	.....	0	67,000	100	9.5	6,365
Exchange Aerial Cable	64,000	13	24,320	6,400	17,920	28	46,080	72	5.5	3,520
Exchange Aerial Wire	53,000	11	.....	.....	.....	0	53,000	100	9.0	4,770
Exch. Underground Conduit	82,000	42	.....	.....	.....	0	82,000	100	2.4	1,968
Exch. Underground Cable	110,000	18.5	55,000	16,500	38,500	35	71,500	65	3.5	3,850
Exch. Submarine Cable	1,300	10	.....	.....	.....	0	1,300	100	10.0	130
Toll Pole Lines	75,000	16	.....	.....	.....	0	75,000	100	6.0	4,500
Toll Aerial Cable	10,000	14	4,500	1,500	3,000	30	7,000	70	5.0	500
Toll Aerial Wire	77,000	19	34,650	16,170	18,480	24	58,520	76	4.0	3,080
Toll Underground Conduit	9,000	50	.....	.....	.....	0	9,000	100	2.0	180
Toll Underground Cable	19,000	25	10,450	3,420	7,030	37	11,970	63	2.5	475
Toll Submarine Cable	1,000	10	.....	.....	.....	0	1,000	100	10.0	100
Furniture and Fixtures	7,000	10	.....	.....	.....	0	7,000	100	10.0	700
Shop Equipment	100	10	.....	.....	.....	0	100	100	10.0	10
Store Equipment	600	10	.....	.....	.....	0	600	100	10.0	60
Garage Equipment	8,000	4	1,600	.....	1,600	20	6,400	80	20.0	1,600
Tools and Implements	4,000	4	800	.....	800	20	3,200	80	20.0	800
Right of Way—Exchange	5,000	16	.....	.....	.....	0	5,000	100	6.0	300
Right of Way—Toll	7,000	33	.....	.....	.....	0	7,000	100	3.0	210
Interest During Constr	8,000	..	.....	.....	.....	..	8,000	100	6.0	480
Total	$1,000,000		$243,940	$53,630	$190,310	..	$809,690			$60,172

—Composite Rate—

(A) Total Investment $1,000,000.

(B) Total Annual Depre. Expense $60,172.

(C) Composite Depreciation Rate (B + A) 6.017%.

[fol. 15324] TOLL CASE—KOSITZKY EXHIBIT No. 2

The Ohio Bell Telephone Company

Services Rendered to the Ohio Bell Telephone Company by the General Staff of the American Telephone and Telegraph Company

A—List of General Engineering Circulars—Side folios 15324 to 15425.

B—List of Specifications, Including 91 that are in Handbook Form—Side folios 15426 to 15455.

C—List of Commercial Circulars—Side folios 15456 to 15458.

D—List of Traffic Circulars—Side folios 15459 to 15467.

A—List of General Engineering Circulars

1 Central Office Equipment.
2 No. 25 Repeating Coil.
(June 6, 1905)
3 Wiring of Desk Stands.
4 Development Plans for Small Cities.
(Replaced by G. E. C. 297)
5 Transmitting "Notes on Exchange Construction."
6 Transmitting Specifications for Forty Wire Pole Line.
(Replaced by G. E. C. 46)
7 Thickness of Sleeves for Cable Splicing.
8 100-Line Automatic Exchange—Charging over trunks.
9 Joint Conduits.
10 High Potential Protectors.
11 Rock Elm Pins as Substitute for Locust.
(Replaced by G. E. C. 613)
12 Multipling Small Cable Terminals.
13 Mercury Arc Rectifier.
(Replaced by G. E. C. 85)
14 Lead Sleeves.
15 Exchange Distribution—Number and Location of Aerial Cable Terminals.
16 Specifications for Underground Construction.
(Replaced by G. E. C. 261)
17 Cable Plans for Small Cities.

[fol. 15325]

18 No. 14 Cable Terminals.

19 600-Pair No. 22 Brown and Sharpe Gauge Cable.
(Replaced by G. E. C. 202)

20 Outside Distributing Wire.
(Replaced by G. E. C. 194)

21 Galvanized Steel Strand.
(Supplemented by G. E. C. 37)

22 Relay Switchboard No. 10.
(Supplemented by G. E. C. 35)

23 Transmitting Notes on Rural Lines.
(Replaced by G. E. C. 263)

24 Specifications for Creosoted Wood Duct and Plank.
(May 17, 1906)
(Supplemented by G. E. C. 180 and 986)

25 Items of Equipment which Affect Transmission.
(Supplemented by G. E. C. 39)
(Replaced by G. C. 51)

26 Handbook of Telephone Substation Circuits—Additional Sheets.

27 Jack Markings.
(Supplemented by G. E. C. 62)
(Replaced by G. E. C. 66)

28 Multiple No. 4 Private Branch Exchange Switchboard.
(Replaced by G. E. C. 307)

29 Residence System No. 1.
(July 30, 1906)

30 Apartment House System No. 1.

31 Private Branch Exchange No. 2.
(August 1, 1906)

32 Slotted Lamp Sockets Mountings.

33 Specifications for Underground Construction.
(Replaced by G. E. C. 261)

34 Economy in Subway Construction.
(Replaced by G. E. C. 261)

35 No. 10 Switchboard.
(Supplementing G. E. C. 22)

36 No. 2 Toll Board.
(Preliminary)
(Replaced by G. E. C. 48)

[fol. 15326]

37 Galvanized Steel Strand.
(Supplementing G. E. C. 21)

38 High Potential Protection.

39 Use of Phantomed Circuits on Built up Connections.
(Supplementing G. E. C. 25)
(Replaced by G. C. 51)

40 Specifications for 12 or 20 Wire Line.
(Replaced by G. E. C. 674)

41 Preservative Treatment of Poles.
(Supplemented by G. E. C. 56 and 365)

42 Conduit Plans.

43 Phantom Circuits.
(Replaced in part by Specifications 3103 and 3120)

44 Iron Wire.

45 Wiring of Telephone Switchboard Lighting Circuits.
(January 16, 1907)
(Replaced in part by G. E. C. 124 and 166)

46 Specifications for 40 to 80 Wire Pole Lines.
(Replacing G. E. C. 6)

47 Insulation Joints in Lead Cable Sheaths.
(Replaced by G. E. C. 630)

48 No. 2 Toll Board.
(Replacing G. E. C. 36)

49 Jack per Station.
(January 29, 1907)

50 Transmitting Report—"The Use of Pole Changers in Central Offices".

51 Aerial Cable Hangers.

52 Cable Records.

53 Height of Wall Sets.
(March 9, 1907)

54 Protection—Street Railway and Electric Power Co's. Telephone System.
(March 13, 1907)
(Replaced in part by G. E. C. 462)

55 Transmittting Specifications for Conduit Construction.
(Replaced by G. E. C. 261)

[fol. 15327]

56 Preservative Treatment of Poles.
(Supplementing G. E. C. 41)
(Supplemented by G. E. C. 728)

57 Notes on Development Studies.
(Replaced by G. E. C. 297)

58 Specifications for 6-Wire, 22 Foot Pole Line.
(Replaced by G. E. C. 674)

59 Cable Relief.

60 Transmitting "Notes on Cable Plans".

61 Slotted Lamp Socket Mountings.
(October 10, 1907)

62 Jack Markings.
(Supplementing G. E. C. 27)
(Replaced by G. E. C. 66)

63 Reversing Plugs.

64 Economies in Concrete Work.
(Replaced by G. E. C. 261)

65 Dry Batteries.

66 Jack Markings.
(May 22, 1908)
(Replacing G. E. C. 27 and 62)

67 New Tinsel Switchboard Cord.
(Replaced by G. E. C. 275)

68 Cable Pulley.

69 Modifications in No. 17-A Test Set.
(Supplemented by G. E. C. 483)

70 Use of Repeating Coils in Toll Cord Circuits for Reducing Noise on Through Toll Connections.
(Replaced by G. E. C. 229)

71 Arrangement of Keyboard Lamp Caps and Guards.
(Supplementing T. C. 2)
(Replaced by G. E. C. 79)

72 "A" and "B" Supervisors' Equipment.
(Supplementing T. C. 1)
(Supplemented by T. C. 17)
(Replaced by G. E. C. 264)

[fol. 15328]

73 Standard Lengths for Three-Conductor Switchboard Cords.
(Replaced by G. E. C. 77)

74 Central Office Records.

75 New Terminal Marking for Toroidal Repeating Coils.
(August 29, 1908)

76 Rural Line Subscribers' Set.
(Supplemented by G. E. C. 92 and 131)

77 Standard 3-Conductor Switchboard Cords.
(Replacing G. E. C. 73)
(Supplemented by G. E. C. 83)
(Replaced by G. E. C. 275)

78 Phantoming Pole Pairs.
(November 30, 1908)

79 Arrangement of Keyboard Lamp Caps, Guards and Cords.
(November 9, 1908)
(Replacing T. C. 2 and G. E. C. 71)
(Supplemented by G. E. C. 199, 540 and 806)
(Replaced in part by G. E. C. 476, 540 and 806)

80 Color Scheme for Desk Stand Cords.

81 Morse Secret Sounder No. 94361.

82 Rock Elm Pins.
(Supplemented by G. E. C. 110)
(Replaced by G. E. C. 613)

83 No. 346 and No. 347 Tinsel Switchboard Cords.
(Supplementing G. E. C. 77)
(Supplemented by G. E. C. 87)
(Replaced by G. E. C. 275)

84 Answering Jack Number Plates.
(September 22, 1909)
(Supplemented by G. E. C. 286)

85 Mercury Arc Rectifier.
(Replacing G. E. C. 13)
(Replaced by G. E. C. 542)

86 No. 17 Cable Terminals.

87 No. 346 and No. 347 Tinsel Cords.
(Supplementing G. E. C. 83)
(Replaced by G. E. C. 275)

88 Transmitter Attachment—"Telephone Noise Eliminator".

89 No. 4 Private Branch Exchange.
(Replacing in part S. C. 8) (Supplementing S. C. 11)
(Replaced by G. E. C. 307)

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90 Color Scheme for Desk Stand Cords.
(January 26, 1910)

91 Emergency Arrangements—Call Circuits and Trunks.
(Replaced by G. E. C. 144)

92 Rural Line Subscribers' Sets.
(March 15, 1910)

93 Copper-Steel Outside Distributing Wire.
(Supplemented by G. E. C. 136 and 139)
(Replaced by G. E. C. 285)

94 Lead Sleeves.
(Replaced by G. E. C. 543)

95 No. 71-A Heat Coil—Pull-out Type.

96 Joints in Iron Wire.
(Supplemented by G. E. C. 603)

97 Test for Desk Stand Cord Connections.
(April 29, 1910)

98 New Tinsel Cords for Toll Purposes.
(Replaced by G. E. C. 275)

99 Rural Line Subscribers' Sets.
(Supplementing G. E. C. 92)

100 Mine Telephone.
(Replacing G. C. 39)

101 Comparative Economies in the Use of Gas and Electricity for Charging Batteries in Telephone Exchanges.
(July 11, 1910)

102 New Standard Trunk Section.
(Replaced by G. E. C. 548)

103 (Never Issued).

104 Central Office Building Plans.

105 New Retardation Coils for Composite and Duplex Sets.

106 Substitution of No. 67 and No. 69 Heat Coils for No. 41 and No. 4-A Heat Coils.
(Replaced by G. E. C. 578)

107 Aerial Loading and Duplex Cable.
(Replaced in part by G. E. C. 253)
(Supplemented by G. E. C. 311)

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108 Proposed New Type of Prepayment Multi-Coin Box.
(Replaced in part by G. E. C. 217)
(Supplemented by G. E. C. 328 and 411)

109 Method of Adding Plates to Storage Batteries.
(September 9, 1910)

110 Creosoted Rock Elm Pins.
(Supplementing G. E. C. 82)
(Replaced by G. E. C. 613)

111 Standard Lengths for Desk Stand Cords.

112 Operator's Transmitter No. 234.

113 High Resistance Transmitters on Local Battery Lines.
(September 26, 1910)

114 No. 49 Type Alarm Fuses.

115 Transmitting Preliminary Draft of Specifications No. 3269 for the Construction of Twenty, Ten and Two Wire Pole Lines.
(Preliminary)
(Supplemented by G. E. C. 674)

116 Abandonment of No. 14-A (10 Pair) Cable Terminal.

117 Protective Coatings for No. 14 Cable Terminals.
(October 29, 1910)

118 Ground Clamps.
(Supplementing G. C. 73)
(Replaced by G. E. C. 155)

119 Worn Plugs and Jacks.
(November 17, 1910)
(Supplemented by G. E. C. 206 and 374)

120 Use of Lock Nuts in No. 14 Cable Terminals.

121 Specifications for Single Armored Submarine Cables With Large Conductors.
(Replaced by G. E. C. 164)

122 Chestnut Guy Stubs.
(December 8, 1910)

123 Telephone Central Office Power Machines and Accessories.
(Supplemented by G. E. C. 367)
(Replaced in part by G. E. C. 511)
(Replaced by G. E. C. 745)

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124 Switchboard Lighting.
(February 7, 1911)
(Replacing in part G. E. C. 45)
(Supplemented by G. E. C. 140, 166, 482 and 726)

125 Fahnestock Test Connector.

126 Standard Substation Cords.
(December 12, 1910)

127 Measuring Instrument—Evershed Megger.
(December 13, 1910)

128 Concrete-Steel Reinforcement for Poles.
(Supplementing G. C. 81 and 90)
(Supplemented by G. E. C. 241)
(Replaced by G. E. C. 451)

129 Improved Single Pulley Switchboard Cord Weight.
(January 6, 1911)
(Supplemented by G. E. C. 196)

130 Blackburn Ground Clamp with Copper Shoe Fastened to Band.
(January 17, 1911)
(Supplemented by G. E. C. 218)

131 Modifications in Standard Magneto Subscribers' Sets.
(Supplementing G. E. C. 76 and 92)

132 No. 1-B Telegraph Set.
(Replaced by G. E. C. 673)

133 No. 20 Instrument Wire.

134 Signal Plugs.
(January 26, 1911)

135 List of Standard Specifications.
(Replaced by G. E. C. 336)

136 Transmission Efficiency of Copper-Steel Outside Distributing Wire.
(February 3, 1911)

137 Number Plate for Operators' Telephone Sets.
(February 17, 1911)
(Supplementing T. C. 18)

138 Revised Draft of Specifications No. 3235 for Exchange Aerial Construction.
(Preliminary)

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139 Copper-Steel Outside Distributing Wire.
(Supplementing G. E. C. 93)
(Replaced by G. E. C. 285)

140 Switchboard Lighting.
(February 21, 1911)
(Makes Correction in G. E. C. 124)

141 Tool for Cleaning Switchboard Jacks—No. 8 Switchboards.
(March 3, 1911)

142 Changes in No. 17 Cable Terminals.
(Preliminary)
(Supplemented by G. E. C. 309)

143 Copies of Printed Handbooks to be Obtained through the Western Electric Company.

144 Emergency Call Circuits and Emergency Local Ringdown Trunks.
(April 3, 1911)
(Replacing G. E. C. 91)
(Replaced in part by G. E. C. 548 and 647)

145 Standard Lengths for Desk Stand Cords.

146 New Toll Switchboard Cord Circuits.
(March 29, 1911)
(Supplemented by G. E. C. 430)

147 Change in No. 229 Transmitters.
(March 31, 1911)

148 Color Scheme for Desk Stand Cord—Explanatory Sheets for the Handbook of Telephone Substation Circuits.

149 No. 11 and No. 12 Protector Micas.
(April 7, 1911)

150 Cable Suspension Clamps.
(Supplemented by G. E. C. 168)

151 Composite Set Rack.
(April 12, 1911)

152 No. 49 Type Alarm Fuses.
(April 6, 1911)
(Replacing G. C. 74)
(Supplemented by G. E. C. 1069)

153 Bulletin No. 17, Storage Batteries—Obtaining Copies in Considerable Quantities.
(Supplementing G. C. 44)
(Replaced by G. E. C. 539)

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154 Discontinuing the Manufacture of No. 11 Repeating Coils.
(Supplemented by G. E. C. 280)

155 Vogel Ground Clamps.
(Replacing G. E. C. 118)

156 New Types of Call Wire Trunk Circuits.
(April 17, 1911)

(Supplemented by G. E. C. 199)

157 Improved Two-Conductor Switchboard Cord.
(Supplemented by G. E. C. 207)
(Replaced in part by G. E. C. 463)

158 Specifications for Vitrified Clay Conduit.
(April 25, 1911)

159 Specifications for Dead Oil of Coal Tar.
(Replaced by G. E. C. 517)

160 Specifications for Exchange Line Glass Insulators.

161 Galvanized Corner Bridle Rings.
(May 3, 1911)

162 No. 157 Receiver.
(May 8, 1911)

163 Revision of Color Group Scheme for Cables.

164 Revised Specifications for Single and Double Armored Submarine Cable.
(Replacing G. E. C. 121)
(Replaced by G. E. C. 573)

165 Revised Specifications No. 3235 for Exchange Aerial Construction.
(Replacing E. C. 21 and G. C. 89)
Supplemented by G. E. C. 257)

166 Toll Switchboard Lighting.
(May 25, 1911)
(Replacing in part G. E. C. 45)
(Supplementing G. E. C. 124)
(Supplemented by G. E. C. 482 and 726)

167 Myers Break Finder.

168 Galvanized Bolts for Cable Suspension Clamps.
(Supplementing G. E. C. 150)
(Replaced by G. E. C. 179)

169 Tracers for Insulated Wire Used in the Outside Plant.
(Replaced by G. E. C. 285)

170 Tool for Grooving Multiple Jacks.
(July 3, 1911)

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171 Auxiliary Night Alarm Circuit for Small Offices.
(July 24, 1911)

172 Typographical Errors—Specifications No. 2877.

173 Substation Number and Instruction Plates.
(Supplemented by G. E. C. 369)

174 Small Magneto Switchboards.
(July 26, 1911)
(Supplemented by G. E. C. 565 and 747)

175 Protection of Receiver Pole Pieces.
(July 28, 1911)

176 Change in Rating of Apparatus Described in the Western Electric Company's Card Catalogues.
(July 31, 1911)

177 Standard Traffic Engineering Methods for Use in Connection with Building Plans.
(July 27, 1911)
(Supplemented by G. E. C. 644)

178 Specifications for Exchange Aerial Construction—Correction.
(Supplementing Specifications 3235)

179 Specifications for Bolts for Cable Suspension Clamps.
(August 18, 1911)
(Replacing G. E. C. 168)

180 Specifications No. 3352 and No. 3385—Creosoted Wood Conduit. Galvanized Sheet-Iron Cable Shield.
(August 18, 1911)
(Supplementing G. E. C. 24)
(Supplemented by G. E. C. 986)

181 Crosstalk Tests.
(August 29, 1911)

182 Protection for Employees in Case of Fire.
(August 24, 1911)
(Supplemented by T. C. 50 and G. E. C. 783)

183 Information on Loading.

184 Revised Specifications No. 3293 for Transposing Single and Phantom Circuits and Dead Ending Wires at Test and Terminal Poles. Each Wire Attached to a Separate Insulator.
(Supplemented by G. E. C. 431 and 444)

185 Change in Open Space Cut-out Equipment of No. 61 Type Protectors.
(September 7, 1911)

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186 Unit Type Protector Bars for Main Distributing Frames.
(September 15, 1911)
(Replaced in part by G. E. C. 385)

187 Specifications for Western White Cedar Poles.
(September 15, 1911)
(Replacing E. C. 7 and 12)

188 Extra Glass Jars for Storage Battery Equipments.

189 Switchboard Platforms and Operators' Chairs.
(September 28, 1911)
(Supplemented by G. E. C. 447, 548, 589 and 1002)

190 Bridle Wire Electrose Insulators.

191 Portable Composite Sets.
(October 3, 1911)

192 Phantoming of Rural Subscribers' Lines.
(September 29, 1911)
(Replaced in part by G. E. C. 371)

193 Exchange Aerial Construction—Specifications No. 3235.
Error in Diagram No. 48
(Supplementing Specifications 3235)

194 No. 14 B & S Outside Distributing Wire.
(Replacing G. E. C. 20)
(Replaced by G. E. C. 616)

195 Improved Cordless Private Branch Exchange Switchboards.
(October 10, 1911)
(Supplemented by G. E. C. 577)

196 No. 116 Cord Weights.
(October 19, 1911)
(Supplementing G. E. C. 129)

197 Specifications for Bridle Wire.
(Replaced by G. E. C. 616)

198 Modifications in Present Type Cordless Private Branch Exchange Switchboards.
(Supplementing G. E. C. 195)
(Replaced by G. E. C. 577)

199 Color Scheme for Ringing Key Buttons and Plug Shells with Mechanically Locking Key Trunks.
(November 6, 1911)
(Supplementing G. E. C. 79 and 156)

200 Reversite Circuit Breakers for No. 1 Power Plants.
(November 13, 1911)

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201 Methods of splicing No. 10 B & S and No. 13 B & S Gauge Cable Conductors.
(Replaced by G. E. C. 702)

202 A: Most Economical Sizes of Cable to Install Underground.
B: Provision of Stubs for Branch from Large Cables.
(Replacing G. E. C. 19)

203 Transmitting Specifications for High Tension Crossings.
(Supplemented by G. E. C. 469 and 528)
(Replaced by G. E. C. 785)

204 Protective Coating for No. 14 Cable Terminals.
(Supplementing G. E. C. 117)
(Supplemented by G. E. C. 454)
(Replaced by G. E. C. 536)

205 Redesign of No. 103 Plug.
(November 24, 1911)

206 Jack Spring Adjusting Tools.
(December 4, 1911)
(Supplementing G. E. C. 119)

207 Standard Lengths for No. 421 Switchboard Cord.
(Supplementing G. E. C. 157)
(Replaced in part by G. E. C. 463).

208 Use of Message Registers.

209 Specifications for Insulating Sealing Compound.
(December 2, 1911)
(Supplemented by G. E. C. 230)

210 New Material Specifications.
(Supplemented by G. E. C. 613)

211 Catalogue of the American Bell Telephone Companies' Instruments.
(December 7, 1911)

212 Standard Lengths for Operators' Telephone Cords.
(December 12, 1911)

213 Specifications for Wood Preservatives.
(Supplemented by G. E. C. 508 and 512).
(Replaced by G. E. C. 581)

214 Modified Nos. 35, 36, 37 and 51 Terminal Strips.
(December 14, 1911)
(Supplemented by G. E. C. 299)

215 Color of Cords and Shells for Test and Plugging Up Lines.
(December 20, 1911)
(Supplemented by G. E. C. 540)

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216 Specifications for Pothead Wire.
(January 9, 1912)
(Replacing G. C. 58)

217 Proposed New Type of Prepayment Multi-Coin Box.
(December 29, 1911)
(Replacing in part G.E.C. 108)
(Supplemented G.E.C. 328 and 411)

218 Blackburn Ground Clamp with Copper Shoe Attached to Band.
(January 5, 1912)
(Supplementing G.E.C. 130)

219 Prices for Materials for Estimating Purposes.
(January 8, 1912)

220 Change in Polar Duplex Set.
(Replaced by G.E.C. 439)

221 Automatic Switch for Electrolysis Drainage Wires.
(January 19, 1912)

222 Specifications for Solder.
(January 31, 1912)
(Supplemented by G.E.C. 780)

223 Antimony Alloy Sheath for Underground Cables.
(January 22, 1912)
(Supplemented by G.E.C. 325)

224 Steel Pins for Porcelain Insulators.
(Replaced by G.E.C. 402)

225 All Metal Flush Type Hotel Sets.
(February 2, 1912)
(Replacing in part S.C. 27)

226 Strain Insulators.

227 Specifications for Creosoted Yellow Pine Crossarms.
(February 16, 1912)
(Supplemented by G.E.C. 583 and 775)

228 Standard Equipment for Handling Telephoned Telegrams and Private Exchange Traffic at Western Union Offices.
(February 23, 1912)
(Supplemented by G.E.C. 302)

229 Use of Repeating Coils in Toll Cord Circuits for Reducing Noise on Through Toll Connections.
(February 21, 1912)
(Replacing G.E.C. 70)

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230 Superior Western Electric Compound.
(February 28, 1912)
(Supplementing G.E.C. 209)

231 Fire Insurance.
(February 28, 1912)

232 Private Branch Exchange Switchboard No. 5.
(Preliminary)
(Replaced by G.E.C. 582)

233 New Standard Toll Test Board No. 4.
(Supplemented by G.E.C. 599)

234 Weatherproof Iron and Steel Wire.

235 Street Railway Telephones.
(Supplemented by G.E.C. 445)

236 Answering Jack Number Plates with Engraved Special Designations.
(March 26, 1912)

237 Porcelain Knobs.

238 Use and Disposition of Non-Standard Material.
(April 12, 1912)

239 Underground Conduit—Duct Requirements on Fundamental Plans.
(April 8, 1912)

240 Revision of Methods for Locating Transposition Poles.
(Preliminary)
(Replaced by G.E.C. 563)

241 Pole Butt Reinforcements.
(Supplementing G.C. 81 and 90 and G.E.C. 128)

242 Cordless Private Branch Exchange Switchboard—Omission of Condensers.
(Supplementing G.E.C. 195)
(Replaced by G.E.C. 577)

243 Moistureproof Compound for Switchboard Wire.
(Replaced by G.E.C. 368)

244 Specifications for Fir Crossarms.
(Supplemented by G.E.C. 583)
(Replaced in part by G.E.C. 708)

245 Metal Subscribers' Sets.
(May 1, 1912)

246 Gauge for Testing Individual Dry Cells in Talking and Ringing Batteries.
(April 29, 1912)
(Replacing G.C. 71)
(Supplemented by G.E.C. 748)

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247 Transmission Equivalents.
(May 2, 1912)
(Supplemented by G.E.C. 418, 419 and 484)
(Replaced in part by G.E.C. 418)

248 Normally Open Telephone Booths—Folding Door Type
(May 8, 1912)
(Supplemented by G.E.C. 291 and 407)

249 No. 250 Transmitter with Steel Arm.
(May 10, 1912)
(Replacing G.C. 45)

250 Standard Switchboard and Circuit Drawings.
(May 3, 1912)
(Supplemented by G.E.C. 322, 375, 403, 520, 672, 689, 766)

252 Substation Switching Keys.
(May 27, 1912)
(Supplemented by G.E.C. 281)

253 Loading of Telephone Circuits.
(June 11, 1912)
(Replacing in part G.E.C. 107)

254 Pole Relays, Code No. 191-A
(May 31, 1912)

255 Materials for Aerial Loading Coil Construction.
(June 10, 1912)

256 Memorandum on the Installation and Maintenance of Joint Telephone and Telegraph Offices, Classes 10-A and 11-A.

257 Subscriber's Station Installation—Line and Ground Wire Holes.
(June 18, 1912)

258 Maintenance of Transmitter Batteries at Isolated Telephone Stations.
(June 28, 1912)

259 Jack for Portable Telephones.
(June 29, 1912)

260 Number Plates for Stile Casings—Nos. 107-B and 23-C.
(July 12, 1912)
(Supplemented by G.E.C. 502)

261 Specifications for Underground Construction.
(Replacing G.E.C. 16, 33, 34, 55 and 64)
(Replaced by G.E.C. 386)

262 Annual Depreciation Rates.
(Supplemented by G.E.C. 330)

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263 Rural Lines—Central Office Equipment and Method of Operating.
(July 17, 1912)
(Replacing G.E.C. 23)
(Supplemented by G.E.C. 855)

264 "A" and "B" Supervisors' Equipment.
(July 29, 1912)
(Replacing T.C. 1 and 17 and G.E.C. 72)
(Supplemented by G.E.C. 548)

265 Standardization of 2-1/2 foot length for Receiver Cords Used with Desk Stands.
(July 16, 1912)

266 Standard Floor Plans for Telephone Central Offices.
(Preliminary)
(Replacing in part G.C. 48)
(Supplemented by G.E.C. 478 and 516)

267 Standardization of Central Office Equipment—Main Distributing Frames.
(Preliminary)
(Replaced by G.E.C. 358)

268 Specifications for Crossarm Braces.
(August 2, 1912)

269 Specifications No. 3505—Racks for Composite Sets and Composite Ringer Sets.
(August 2, 1912)

270 Relay Switchboard No. 10—Provision of Extra Panel of Multiple at the End of the Board.

271 Method of Increasing "B" Operating Efficiency During Hours of Light Traffic.
(August 15, 1912)
(Replaced in part by G.E.C. 765)
(Supplemented by G.E.C. 797)

272 Appraisal of Replacement Cost of Physical Plant.
(Supplemented by G.E.C. 287)

273 Redesigned No. 7 Coin Collector.
(August 24, 1912)

274 Material Used in Exchange Aerial Construction.

275 Improved Tinsel Switchboard Cords.
(August 30, 1912)
(Replacing C 17 and G.E.C. 67, 77, 83, 87 and 98)
(Supplemented by G.E.C. 376)

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276 Changes in Specifications for Pole Line Hardware.
(September 19, 1912)

277 Installation of Loading Coils T-300, T-680 and T-685 on Open Wire Lines—Specifications No. 3525.
(September 23, 1912)
(Supplementing G.E.C. 255)

278 Prevention of Electrolytic Corrosion in Prepayment No. 7 Coin Collector Coils.
(September 27, 1912)

279 Hub Guards.
(October 14, 1912)

280 Discontinuing the Manufacture of No. 11 Repeating Coils.

(Supplementing G.E.C. 154)

281 Substation Switching Keys.
(October 10, 1912)
(Supplementing G.E.C. 252)

282 Testing Cabinet for Magneto and Small Common Battery Offices.
(October 9, 1912)

283 Appraisal of Physical Plant—
(a) Typical Unit Costs.
(b) Suggestions as to Summary Forms.
(Supplemented by G.E.C. 361)

284 Specifications for Creosoted Yellow Pine Crossarms.
(Supplementing Specifications 3231 and G.E.C. 227 and 775)

285 Specifications for No. 17 Copper-Steel Wire.
(Replacing G.E.C. 93, 139 and 169)
(Replaced by G.E.C. 616)

286 Rubber Faced Answering Jack Number Plates.
(October 25, 1912)
(Supplementing G.E.C. 84)

287 Appraisal of Replacement Cost of Physical Plant.
(Supplementing G.E.C. 272)

288 Wiring of Large Buildings for Telephone Service.
(November 4, 1912)
(Replacing Bulletin 15 and G.C. 42)
(Supplemented by G.E.C. 768)

289 Standardization of Central Office Equipment Intermediate Distributing Frames.
(Preliminary)
(Replaced by G.E.C. 395)

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290 Improvement in No. 85 Type Substation Relay.

291 Folding Door Booth.
(November 25, 1912)
(Supplementing G.E.C. 248)
(Supplemented by G.E.C. 407)

292 Circuit for Grouping "A" and "B" Positions.
(November 27, 1912)
(Supplemented by G.E.C. 314, 447 and 589)

293 Rules for Resuscitation from Electric Shock.
(Supplemented by G.E.C. 532)

294 Standard Traffic Engineering Practices for Local and Toll Central Office Equipments.
(Supplemented by G.E.C. 540, 589 and 647)
(Replaced in part by G.E.C. 447, 548, 589 and 647)
(Replaced by G.E.C. 644)

295 No. 128 Receivers with and without Head Bands.
(December 5, 1912)

296 Standard Specifications for Repaired Material.
(December 9, 1912)
(Supplemented by G.E.C. 554)

297 Method of Making Fundamental Plans.
(December 27, 1912)
(Replacing G.E.C. 4 and 57)

298 Transmitting Specifications No. 3522—Replacement and Reinforcement Inspection of Pole Lines.
(December 12, 1912)
(Replacing G.C. 78)
(Supplemented by G.E.C. 685)

299 Modified Nos. 38, 39 and 40 Terminal Strips.
(January 6, 1913)
(Supplementing G.E.C. 214)

300 Metal Battery Box for Subscribers' Stations.
(January 10, 1913)

301 Method of Wiring Condensers in Toll Cord Circuits.
(January 2, 1913)

302 Cost of Private Branch Exchange Equipment for Receiving and Delivering Telegrams.
(January 13, 1913)
(Supplementing G.E.C. 228)

303 New Type Transmitter Arms.
(December 31, 1912)
(Replacing S.C. 24)

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304 Local and Toll Service Observing Equipment.
(Replaced by G.E.C. 534)

305 Improvement in Blue Bell Dry Battery.
(January 9, 1913)

306 Changes in No. 317 Type Subscribers' Sets.
(January 14, 1913)

307 No. 4 Private Branch Exchange.
(December 31, 1912)
(Supplementing S.C. 11)
(Replacing G.E.C. 28 and 89)

308 Transmitters for Metal Subscribers' Sets.
(Supplementing G.E.C. 245)
(Supplemented by G.E.C. 389)

309 Changes in No. 17 Cable Terminals.
(Supplementing G.E.C. 142)

310 Specifications No. 3375—Master Specifications for Composite Cable (Non-duplexed).
(Replaced by G.E.C. 575)

311 Duplex Cable.
(Supplementing G.E.C. 107)
(Replaced by G.E.C. 473)

312 Specifications for Cement and for the Inspection of Cement.
(January 27, 1913)

313 Improved Cord Hole Eyelet for Desk Stand Bases.
(February 5, 1913)

314 Circuit for Grouping "A" and Toll Switching Positions.
(February 8, 1913)
(Supplementing G.E.C. 292)

315 Improved Terminal Rack for Desk Stands and Transmitter Arms.
(February 14, 1913)

316 Connecting Block with Soldering Lugs.
(February 3, 1913)
(Supplemented by G.E.C. 531)

317 Changes in Equipment and Arrangement of No. 1 Trunk Switchboard Keyshelves.
(February 18, 1913)
(Replacing T.C. 5)
(Replaced in part by G.E.C. 548)
(Supplemented by G.E.C. 1057)

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318 Changes in Nos. 5 and 23 Induction Coils.
(February 4, 1913)

319 Alarm Signal for the Main Discharge Fuse.
(Preliminary)
(Replaced by G.E.C. 457)

320 Equipment for Public News Telephone Service.
(February 7, 1913)
(Supplementing S.C. 30)

321 Revised Specifications for Composite Sets.
(March 4, 1913)

322 Standard Switchboard and Circuit Drawings.
(February 19, 1913)
(Supplementing G.E.C. 250)
(Supplemented by G.E.C. 375 and 403)

323 Improved Ringer for Common Battery Four-party Selective Ringing Service.
(February 21, 1913)

324 Phantoming of Rural Subscribers' Lines—No. 1 Retardation Coil Box.
(February 20, 1913)

325 Antimony Alloy Sheath for Aerial Cables.
(February 15, 1913)
(Supplementing G.E.C. 223)

326 New Design of the No. 65 Terminal Strip for Horizontal Side of Main Distributing Frames.
(March 3, 1913)

327 Standardization of Central Office Equipment—Relay Racks.
(Preliminary)
(Replaced by G.E.C. 398)

328 Method of Handling Toll Calls from New Type Prepayment Multi-Coin Boxes.
(March 6, 1913)
(Supplementing G.E.C. 108 and 217)
(Supplemented by G.E.C. 411)

329 Standard Switchboard and Circuit Drawings.
(Supplementing G.E.C. 250)
(Supplemented by G.E.C. 394)

330 Rates of Depreciation.
(Supplementing G.E.C. 262)

331 Use of Tungsten Lamps for Resistance in Coin Box Current Leads.
(April 3, 1913)
(Replaced in part by G.E.C. 426 and 710)

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332 Metal Block Protected Cable Terminal.

333 Standardization of Black Finish for Ringer Gongs and Clapper Guards.
(March 25, 1913)

334 Arrangement of Equipment on Subscribers' Operators' Keyshelves for No. 92 Jack, 8-Panel Sections—Keyshelf locks—Grounding of Keyshelves.
(Replaced by G.E.C. 447)

335 Simplex Sets—Revised Specifications.
(Replaced by G.E.C. 409)

336 List of Standard Specifications.
(Replacing G.E.C. 135)
(Replaced by G.E.C. 794)

337 Standardization of Central Office Equipment—Installation Practices.
(Supplemented by G.E.C. 422 and 447)
(Replaced by G.E.C. 505)

338 No. 157 Receiver—Distinguishing Mark.
(April 17, 1913)

339 Wiring of the Outgoing Trunk Multiple Directly to the Main Frame and Intermediate Type Terminal Strip for the Main Distributing Frame.
(April 24, 1913)

340 Markings upon Bar or Cake Solder.
(Supplemented by G.E.C. 568)

341 Standard Switchboard and Circuit Drawings.
(Supplementing G.E.C. 250)
(Supplemented by G.E.C. 394)

342 List of Circular Letters and Bulletins.
(Replaced by G.E.C. 810, issued June 28, 1918)

343 Peg Count Register Key.
(May 6, 1913)
(Supplementing T.C. 31)
(Replaced in part by G.E.C. 447, 548, 589, 647 and 808)

344 Specifications for Telephone Power Machines.
(Replaced by G.E.C. 745)

345 Catalogue Cards of the American Bell Telephone Company's Transmitters and Receivers.
(April 21, 1913)

346 Tree Trimming and the Care of Trees.

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347 (Never issued).

348 (Never issued).

349 New Substation Receiver.
(April 24, 1913)
(Supplemented by G.E.C. 389 and 529

350 Auxiliary Framing on Terminal Room Ceilings for the Support of Frames, Cable Racks, etc.
(May 14, 1913)

351 Ventilating System for Telephone Booths.
(May 21, 1913)

352 Connecting Blocks for Use at Substations.
(May 22, 1913)
(Supplemented by G.E.C. 676)

353 Insulated Transmitters—Manufacturer's Testing Clip.
(May 20, 1913)
(Supplemented by G.E.C. 389)

354 Reporting Defective Material.
(June 9, 1913)
(Supplemented by G.E.C. 690)

355 Bridging Connectors Nos. 1, 2 and 3.
(June 2, 1913)

356 Method of Tying Receiver Cords—Sheets for the Handbook of Telephone Substation Circuits.
(Supplementing G.E.C. 349)

357 Standardization of Central Office Equipment—Coil Rack and Fuse Boards.
(Replaced by G.E.C. 501)

358 Standard Main Distributing Frames.
(June 23, 1913)
(Replacing G.E.C. 267)
(Supplemented by G.E.C. 675 and 798)

359 Standardization of Central Office Equipment—No. 92—Jack 8-Panel Subscribers' Sections.
(Replaced by G.E.C. 447)

360 Requirements for 25-Foot Class "C" Cedar Poles.
(June 25, 1913)

361 Appraisal of Physical Plant—Checking Unit Costs.
(Supplementing G.E.C. 283)

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362 Errors in Assembly—No. 38-B Repeating Coils.

363 New Standard Central Office Message Register —Lockup Type.
(July 14, 1913)

364 Tools for Removing Worn No. 49 Jack Sleeves.
(July 7, 1913)

365 Brush Treatment for Poles.
(July 11, 1913)
(Supplemented by G.E.C. 400)

366 Information in Regard to New or Modified Apparatus—Issuing of Western Electric Company Catalogue Cards.
(July 15, 1913)

367 Direct Current Commutating Pole Motors for Charging Generators.
(July 16, 1913)

368 Transmitting Specifications No. 3292 for Beeswax Compound.
(July 21, 1913)
(Replacing G.E.C. 243 and Specifications 3242)

369 Substation Number and Instruction Plates.
(August 1, 1913)

370 Insulation of Metal Subscribers' Equipment from Metal Walls.
(August 19, 1913)

371 New Phantom Circuit Repeating Coil—Code No. 46-A. Discontinuance of Manufacture of Nos. 25-AA, 37-A, 37-B and 38-B Repeating Coils.
(September 2, 1913)
(Replacing G.C. 84)
(Replacing in part G.E.C. 192)

372 Rubber Covered Plug Shelves.
(July 18, 1913)

373 Abandonment of Compound Receiver No. 113.

374 Gauges for No. 92 Jack Sleeves.
(July 22, 1913)
(Supplementing G.E.C. 119)

375 Standard Switchboard and Circuit Drawings—Relay Switchboard No. 1.
(July 25, 1913)
(Supplementing G.E.C. 250 and 322)
(Supplemented by G.E.C. 403)

376 Improved Tinsel Switchboard Cord.
(July 29, 1913)
(Supplementing G.E.C. 275)
(Supplemented by G.E.C. 463 and 864)

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377 Standardization of Engraving for Call Circuit Key Buttons.
(August 6, 1913)

378 Transmitters for Use with No. 50 Coin Collectors.
(August 6, 1913)
(Supplemented by G.E.C. 389)

379 Improved Worsted Receiver Cords.
(August 6, 1913)

380 Machine Ringing—Premature Operation of Tripping Relays Due to Breakdown of Line Insulation.
(August 19, 1913)

381 No. 84-E Interrupter for Four-Party Selective Ringing.—No. 84-B Abandoned.
(August 15, 1913)
(Supplemented by G.E.C. 841)

382 Installation of Loading Coils No. 511 (T-680) and No. 512 (T-685) on Open Wire Lines: Spacing Coils and Grouping Coils on Poles at Loading Points.—Specifications No. 3620.
(August 26, 1913)

383 Standardization of Central Office Equipment—Specifications No. KS-2, "Switchboard Wiring and Mounting of Apparatus for Central Office Equipment".
(Replaced by G.E.C. 540)

384 Specifications for Message Register Generators—Increase in Voltage.
(Supplementing G.E.C. 363)
(Replaced by G.E.C. 745)

385 New Unit Type Protector Mounting for Main Distributing Frames.
(September 9, 1913)
(Replacing in part G.E.C. 186)

386 Transmitting Specifications No. 3613—Revised Specifications for Underground Conduit Construction.
(September 12, 1913)
(Replacing G.E.C. 261)
(Supplemented by G.E.C. 420, 793 and 874)

387 Battery Boxes for Dry Cells—Use of Dry Cells Morse Local Battery and Transmitter Local Battery.
(September 16, 1913)

388 Revised Specifications Nos. 3356 and 3357 for Nos. 22 and 19 Gauge Cable Respectively.
(Supplemented by G.E.C. 598)

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389 Insulated Substation Apparatus.
(October 11, 1913)
(Supplementing G.E.C. 349, 353 and 378)

390 Rope Containing Metallic Strands.
(September 26, 1913)

391 Inventory by Interstate Commerce Commission.

392 Tandem Trunking Method for Handling A-B Toll and Free Traffic.
(October 3, 1913)

393 Tool for Removing Lamp Caps Mounted on Close Centers.
(October 6, 1913)

394 Standard Switchboard and Circuit Drawings.
(Supplementing G.E.C. 250, 329 and 341)

395 Standard Intermediate Distributing Frames.
(October 9, 1913)
(Replacing G.E.C. 289)
(Supplemented by G.E.C. 654)

396 Cord for Suspended Type Transmitter.
(October 13, 1913)

397 Supplying Ringing Current over Cable Pairs to Private Branch Exchanges.
(October 14, 1913)

398 Standard Relay Racks.
(October 17, 1913)
(Replacing G.E.C. 327)
(Supplemented by G.E.C. 475)

399 Switchboard Platforms and Operators' Chairs.
(Supplementing G.E.C. 189)
(Supplemented by G.E.C. 628)

400 Specifications for Brush Treatment of Poles.
(October 18, 1913)
(Supplementing G.E.C. 365)

401 Transmitting Specifications for Crossings of Telephone Lines over Steam Railroads.
(October 20, 1913)
(Supplemented by G.E.C. 530)

402 One Point Transposition Brackets and Steel Pins for Transposition Brackets.
(October 23, 1913)
(Replacing G.E.C. 224)

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403 Standard Switchboard and Circuit Drawings.
(October 31, 1913)
(Supplementing G.E.C. 250, 322 and 375)

404 No. 12 Type Fuse—Improved Design.

405 Standard Drop Light Handle and Guard for Use in Operating and Terminal Rooms.
(November 10, 1913)

406 Letter Code for Indicating Variations in Dimensions on Drawings.
(November 21, 1913)

407 Folding Door Booth.
(November 26, 1913)
(Supplementing G.E.C. 248 and 291)
(Supplemented by G.E.C. 533)

408 Installation of Loading Coils on Open Wire Lines—Specifications for Loading Pole-Pair Circuits—Specifications No. 3617.
(December 29, 1913)

409 Simplex Set—Transmitting Specifications No. 3623.
(December 15, 1913)
(Replacing G.E.C. 335)

410 Standard Switchboard and Circuit Drawings.
(Supplementing G.E.C. 250)

411 No. 50 Type Prepayment Multi-Coin Collector.
(December 20, 1913)
(Supplementing G.E.C. 108, 217 and 328)

412 Standard Switchboard and Circuit Drawings.
(Supplementing G.E.C. 250)

413 Guy Anchors—Special Types.
(Supplemented by G.E.C. 697 and 796)

414 Improved Operator's Telephone Set Cord.
(January 9, 1914)

415 Cable Terminal for Use in Buildings—Standardization of No. 22 Cable Terminal and Nos. 1, 2 and 3 Fanning Strips.
(January 19, 1914)
(Supplemented by G.E.C. 768)

416 No. 1 Type Ground Strip for Nos. 17 and 80 Type Protectors.
(January 12, 1914)

417 Switchboard Clocks for Use at "A" Positions.
(January 31, 1914)
(Supplemented by G.E.C. 471 and 600)

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418 Supplement No. 1 to Bulletin on Transmission Equivalents.
February 6, 1914)
(Supplementing and replacing in part G.E.C. 247)
(Supplemented by G.E.C. 419 and 484)

419 Transmission Data.
(February 6, 1914)
(Supplementing G.E.C. 247 and 418)

420 Underground Conduit Material Specifications.
(February 16, 1914)
(Supplementing G.E.C. 386)
(Supplemented by G.E.C. 679 and 873)

421 Standardization of Central Office Equipment—Miscellaneous Equipment Practices.
(Replaced by G.E.C. 521)

422 Standardization of Central Office Equipment—Installation Practices.
(Supplementing G.E.C. 337)
(Replaced by G.E.C. 505)

423 Power Plant Wiring—Omission of Individual Cell Voltmeter Leads to Storage Batteries.
(February 21, 1914)

424 Standardization of Central Office Equipment—Proposed Standard Message Register Racks.
(Replaced by G.E.C. 537)

425 Emergency Plugging-Up Cords—Relay Switchboard No. 1
(February 27, 1914)
(Supplemented by G.E.C. 689 and 766)

426 Use of Tungsten Lamps for Resistances in Coin Box Current Leads.
(February 17, 1914)
(Replacing in part G.E.C. 331)

427 Pick-up Alarm Circuit—Machine Ringing.
(February 28, 1914)

428 Improved Types "A" and "B" Composite Ringers.
(April 8, 1914)

429 Repair of Tinsel Switchboard Cords.
(February 26, 1914)
(Supplemented by G.E.C. 848)

430 High Impedance Relay for Use in New Toll Cord Circuits.
(March 3, 1914)
(Supplementing G.E.C. 146)

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431 Transmitting Specifications No. 3639—Transposing Single and Phantom Circuits and Dead-ending Wires at Test and Terminal Poles, Each Wire Attached to a Separate Insulator.
(February 27, 1914)
(Supplemented by G. E. C. 444 and 618)

432 Testing Circuit for Use in Connection with New Toll Cord Circuits.
(March 4, 1914)

433 Standardization of Central Office Equipment—No. 92 Jack 7-Panel Trunk Sections.
(Replaced by G. E. C. 548)

434 Residence System No. 1.
(March 26, 1914)
(Supplemented by G. E. C. 591)

435 Transmitting Specifications No. 3629—Installation of Loading Coils on Open Wire Lines, "H" Fixture Construction Along the Line.
(April 27, 1914)

436 Folding Handle for Emergency Hand Generators.
(March 25, 1914)

437 All Metal Telephone Booths.
(March 16, 1914)
(Supplemented by G. E. C. 533)

438 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

439 Polar Duplex Telegraph System—Specifications No. 3558.
(Replacing G. E. C. 220)

440 New Type Line and Cut-off Relay.
(March 31, 1914)
(Supplemented by G. E. C. 475)

441 Separation of Aerial Cable Strand Ground and Protector Ground at Underground Cable Terminals.
(Supplementing Specifications 3235)
(Supplemented by G. E. C. 641)

442 Plan for Giving Independent Companies Service over Bell Toll Lines.
(April 10, 1914)
(Supplemented by G. E. C. 486)

443 Transmitters and Receivers Removed from Subscribers' Stations.
(April 18, 1914)

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444 Transmitting Specifications No. 3664—"Transposing Phantom Circuits Made Up of Pole Circuits on Adjacent Arms, Terminating Wires at Test Poles and Terminal Poles, Each Wire Attached to a Separate Insulator."
(April 10, 1914)
(Supplementing G. E. C. 431)

445 Street Railway Telephone Set No. 278.
(Supplementing G. E. C. 235)

446 Photographs of Construction Work.

447 Standard No. 92 Jack 8-Panel Subscribers' Section.
(May 26, 1914)
(Supplementing G. E. C. 189 and 292)
(Replacing in part G. E. C. 294 and 343)
(Supplemented by G. E. C. 589)
(Replaced in part by G. E. C. 773)

448 Omission of Subscribers' Multiple from "A" Switchboards—Multiple Answering Jacks and Lamps.
(May 25, 1914)

449 Machine for Cleaning Switchboard Plugs.
(April 29, 1914)

450 Maximum Cable Lengths.

451 Concrete Steel Reinforcement for Poles.
(May 12, 1914)
(Replacing G. E. C. 128)

452 Modification of No. 61 Protector Mounting.
(May 11, 1914)

453 Marking of Defective Pairs in Lead Covered Cable.
(May 13, 1914)
(Supplemented by G. E. C. 604)

454 Galvanizing No. 14 Cable Terminals.
(Supplementing G. E. C. 204)
(Replaced by G. E. C. 536)

455 New Local Test Desk for No. 1 Relay Switchboard Equipments.
(May 18, 1914)
(Supplemented by G. E. C. 560)

456 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

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457 Alarm Signal for Main Discharge Fuse.
(May 14, 1914)
(Replacing G. E. C. 319)
(Supplemented by G. E. C. 817)

458 Plugging Up Lines in Trouble.
(May 14, 1914)

459 Automatic Keyshelf Brace.
(May 15, 1914)

460 Specifications for Silk and Cotton Insulated Cable. Specifications Nos. 3650, 3651 and 3652.
(May 22, 1914)

461 Moisture-proof Switchboard Cable.
(May 19, 1914)
(Supplemented by G. E. C. 762)

462 Connection of Private Signaling Circuits to the Telephone Plant.
(June 1, 1914)
(Replacing in part G. E. C. 54)
(Supplemented by G. E. C. 523)

463 Improved Two-Conductor Tinsel Switchboard Cord, Improved Test and Morse Board Cords and Service Observing Cords.
(May 27, 1914)
(Replacing in part G. E. C. 157 and 207)
(Supplementing G. E. C. 376)

465 New Type Buzzer for Private Branch Exchanges.
(June 15, 1914)
(Supplemented by G. E. C. 972)

466 Specifications for Manila Rope.
(June 17, 1914)

467 Clearance of Telephone Wires, Cables and Guys at Highway Crossings.
(June 19, 1914)

468 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

469 (a) Joint Use of Poles.
(b) High Tension Crossings.
(July 13, 1914)

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470 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

471 Switchboard Clocks for Use at "A" Positions.
(July 23, 1914)
(Supplementing G. E. C. 417)

472 Specifications No. 3630—Preliminary Specifications for No. 22 Gauge Cable (Small Diameter Type).
(Replaced by G. E. C. 494)

473 Duplex Cable.
(July 28, 1914)
(Replacing G. E. C. 311)
(Supplemented by G. E. C. 597, 598 and 657)

474 No. 50-A Coin Collector.
(July 29, 1914)

475 Standard Relay Rack.
(August 11, 1914)
(Supplementing G. E. C. 398 and 440)

476 Arrangement of Keyboard Lamp Caps and Guards, and Pilot Lamp Caps and Guards.
(August 5, 1914)
(Replacing in part G. E. C. 79)

477 Splicing Cable—Use of Cotton Sleeving.
(Supplemented by G. E. C. 538)

478 Standard Floor Plan Arrangements for Telephone Buildings, in Single-Office Districts.
(August 25, 1914)
(Supplemented by G. E. C. 516)

479 Enameled Distributing Frame Wire.
(August 28, 1914)
(Supplemented by G. E. C. 761)

480 Copper Block Cut-out for No. 8 Type Protector.
(August 31, 1914)

481 Transmitting Preliminary Draft—Handbook of Substation Practice.
(Supplemented by G. E. C. 596, 622, 642 and 712)

482 Switchboard Lighting.
(September 14, 1914)
(Supplementing G. E. C. 124 and 166)
(Supplemented by G. E. C. 726)

483 Linemen's Test Set—No. 17 Type.
(September 15, 1914)

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484 Transmittal of "Examples Illustrating the Use of the Bulletin on Transmission Equivalents" and Printed Copy of "Supplement No. 1 to Bulletin on Transmission Equivalents."
(September 24, 1914)
(Supplementing G. E. C. 247 and 418)

485 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

486 Plan for Giving Independent Companies Service Over Bell Toll Lines.
(October 13, 1914)
(Supplementing G. E. C. 442)
(Supplemented by T. C. 123)

487 Railroad Private Branch Exchange Equipment.
(November 27, 1914)

488 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

489 Instructions Governing the Use of Dynamite.
(Supplementing Specifications 2079)
(Supplemented by G. E. C. 776 and 799)

490 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

491 Standardization of Central Office Equipment—Location of Rolling Ladders Relative to Frames and Racks.
(November 11, 1914)

492 Collection of Federal Tax on Telephone Messages.
(Supplemented by G. E. C. 495, 499, 504 and 518)
(Replaced by G. E. C. 669)

493 Ticket Pad Holder and Ticket Receptacle.
(November 30, 1914)

494 Small Diameter Type Cable—Specifications No. 3729.
(December 1, 1914)
(Replacing G. E. C. 472)
(Supplemented by G. E. C. 598)

495 Collection of Federal Tax on Telephone Messages.
(Supplementing G. E. C. 492)
(Supplemented by G. E. C. 499, 504 and 518)
(Replaced by G. E. C. 669)

496 New Type Supervisory Relay.
(November 27, 1914)

497 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

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498 Grounding Cables at Office Manholes.
(Replacing C. 21)

499 Collection of Federal Tax on Telephone Messages.
(Supplementing G. E. C. 492 and 495)
(Supplemented by G. E. C. 504 and 518)
(Replaced by G. E. C. 669)

500 Oil Insulators and Pedestal Supports for Mounting Storage Batteries.
(December 8, 1914)

501 Standard Fuse Boards and Subscribers' and Trunk Coil Racks.
(December 15, 1914)
(Replacing G. E. C. 357)
(Supplemented by G. E. C. 854)

502 Number Plates Nos. 1-B, 2-B, 12-B and 113-B.
(December 16, 1914)
(Supplementing G. E. C. 260)

503 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

504 Collection of Federal Tax on Telephone Messages.
(Supplementing G. E. C. 492, 495 and 499)
(Supplemented by G. E. C. 518)
(Replaced by G. E. C. 669)

505 Standardization of Central Office Equipment—Standard Installation Practices.
(December 22, 1914)
(Replacing G. E. C. 337 and 422)
(Supplemented by G. E. C. 540)

506 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

507 Cross-connecting Wire for Duplex Cable.
(Supplementing G. E. C. 473)
(Replaced by G. E. C. 615)

508 Dead Oil of Coal Tar for Brush Treatments.
(Supplementing G. E. C. 213 and Specifications 3430)
(Replaced by G. E. C. 581)

509 Modification of Operators' Telephone Sets.
(Replaced by G. E. C. 661)

510 Guy Hooks.
(February 15, 1915)
(Supplementing G. E. C. 276)

511 Starters for Alternating Current Motors.
(February 10, 1915)
(Replacing in part G. E. C. 125)

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512 Substitute for Carbolineum.
(Supplementing G. E. C. 213 and Specifications 3431)
(Replaced by G. E. C. 581)

513 Composite Cable (Non-Duplex) Combinations.
(February 17, 1915)
(Supplemented by G. E. C. 544)

514 No. 9 Switchboard Equipment—Information in Regard to Stock Equipment and Time Required to Make Deliveries.
(February 18, 1915)

515 No. 5-L Type Message Register.
(February 24, 1915)

516 Standard Floor Plan Arrangements for One-unit Telephone Buildings in Multi-office Districts.
(March 4, 1915)
(Supplementing G. E. C. 478)

517 Specifications for Dead Oil of Coal Tar.
(March 11, 1915)
(Replacing G. E. C. 159)

518 Collection of Federal Tax on Telephone Messages.
(Supplementing G. E. C. 492, 495, 499 and 504)
(Replaced by G. E. C. 669)

519 Telegraph Key No. 1-A.
(March 12, 1915)

520 Standard Switchboard and Circuit Drawings.
(March 17, 1915)
(Supplementing G. E. C. 250)

521 Standardization of Central Office Equipment—Miscellaneous Standard Equipment Practices.
(March 19, 1915)
(Replacing G. E. C. 421)
(Supplemented by G. E. C. 615)

522 Glass Sand Trays and Glass Covers for Storage Batteries.
(March 24, 1915)

523 Line Fuse for No. 74 Type Protector.
(April 1, 1915)
(Supplementing G. E. C. 462)

524 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

525 Standard Armature Air Gaps for Substation Ringers.
(April 3, 1915)

526 Redesigned No. 44 Type Fuse.
(April 5, 1915)
(Supplemented by G. E. C. 1069)

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527 Notes on Toll Fundamental Plans.
(July 1, 1915)

528 High Tension Crossings.
(April 28, 1915)
(Supplemented by G. E. C. 784 and 785)

529 No. 144 Receiver—Code Number in Ear Cap.
(April 20, 1915)
(Supplementing G. E. C. 349)

530 Specifications for Crossings of Telephone Lines over Steam Railroads.
(April 23, 1915)
(Supplementing G. E. C. 401)

531 Standardization of No. 10 Type Connecting Block.
(April 28, 1915)
(Supplementing G. E. C. 316)

532 Rules for Resuscitation of Persons Overcome by Gas.
(Supplementing G. E. C. 293)

533 Folding Door Booth.
(April 30, 1915)
(Supplementing G. E. C. 407 and 437)

534 Local and Toll Service Observing Equipments.
(June 9, 1915)
(Replacing G. E. C. 304)

535 Burnisher No. 1-A.
(May 14, 1915)

536 Galvanizing No. 14 Cable Terminals.
(May 18, 1915)
(Replacing G. E. C. 204 and 454)

537 Standard Message Register Racks and Casings.
(May 24, 1915)
(Replacing G. E. C. 424)
(Supplemented by G. E. C. 777)

538 Splicing Cable—Use of Cotton Sleeve.
(Supplementing G. E. C. 477)
(Replaced by G. E. C. 604)

539 Specifications No. 3750—"The Care and Operation of Storage Batteries".
(June 10, 1915)
(Replacing Bulletin 17 and G. E. C. 153)

540 Specifications No. KS-2-Switchboard Wiring and Mounting of Apparatus for Central Office and Private Branch Exchange Equipments.
(May 21, 1915)
(Replacing in part G. E. C. 79)
(Replacing G. E. C. 383)
(Supplementing G. E. C. 79, 215, and 505)
(Supplemented by G. E. C. 637 and 806)
(Replaced in part by G. E. C. 806)

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541 Cincinnati Clips.
(May 26, 1915)

542 Mercury Arc Rectifiers for Charging Storage Batteries.
(July 23, 1915)
(Replacing G. E. C. 85)
(Supplemented and replaced in part by G. E. C. 754)

543 Specifications for Lead Sleeving.
(June 11, 1915)
(Replacing G. E. C. 94)

544 Composite Cable (Non-Duplex) Combinations.
(June 29, 1915)
(Supplementing G. E. C. 513)
(Supplemented by G. E. C. 657)

545 Abandonment of High Resistance Heat Coils.
(July 7, 1915)

546 Standardization of Spring Terminals and No. 540 Cord for Connection of Blue Bell Dry Batteries.
(July 9, 1915)
(Supplemented by G. E. C. 856)

547 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

548 Standard No. 92-Jack, 7-Panel Trunk Section.
(August 5, 1915)
(Replacing G. E. C. 102 and 433)
(Replacing in part G. E. C. 144, 294, 317 and 343)
(Supplementing G. E. C. 189 and 264)
(Replaced in part by G. E. C. 763 and 773)

549 Improved Loud Ringing Extension Bell Sets.
(July 30, 1915)

550 Receiver Cords—Covering for Tips.
(August 3, 1915)

551 No. 29—A Binding Post—Auxiliary Binding Post for Nos. 14 and 8 Cable Terminals.
(August 4, 1915)

552 Routine and Equipment for Handling Trouble Reports and Certain Associated Work.
(August 9, 1915)
(Replaced in part by G. E. C. 893)

553 Copyrighting Publications.
(August 6, 1915)

554 Recovery of Substation Equipment
(August 6, 1915)
(Supplementing G. E. C. 296)

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555 Effect of Metal Prices on Cable Changes.
(August 10, 1915)

556 Desk Stand Cords with Improved Tinsel.
(August 11, 1915)

557 Waterproof Desk Stand Cords.
(August 12, 1915)

558 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

559 Primary Battery for Current Supply for Magneto Switchboards.
(August 17, 1915)
(Supplemented by G. E. C. 625 and 802)

560 Local Test Desk No. 12.
(September 15, 1915)
(Supplementing G. E. C. 455)
(Supplemented by G. E. C. 666 and 672)

561 Nut Fit for Bolts Having a Short Length of Thread.
(August 25, 1915)
(Supplementing G. E. C. 276, and Specifications 3069, 3124, 3326, 3382 and 3550)

562 Specifications for Storage Batteries—Chloride Accumulator Type.

563 Specifications No. 3736—"Specifications for Locating Transpositions—Standard System."
(October 15, 1915)
(Replacing G. E. C. 240)
(Replacing in part Specifications 2851, 2277, 2942, 3120, 3146 and Preliminary Draft of 3269)
(Supplemented and replaced in part by (G. E. C. 738)

564 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

565 Magneto Switchboards No. 105-A and No. 105-B.
(October 5, 1915)
(Supplemented by G. E. C. 747)
(Supplementing G. E. C. 174)

566 Reels of Copper-steel Outside Distributing Wire.
(Supplementing Specifications 3534)
(Replaced by G. E. C. 616)

567 Distinguishing Colors for Distributing Frame Wire.
(Replaced by G. E. C. 587)

568 Markings upon Bar and Cake Solder.
(October 25, 1915)
(Supplementing Specifications 3438, 3439 and 3440)

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569 Handling Carbon Protector Blocks and Micas.
(October 26, 1915)

570 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

571 Telephone Connections for Trains at Stations.
(November 29, 1915)

572 Standard Lengths for Receiver and Desk Stand Cords.
(December 1, 1915)

573 Specifications for Submarine Cable—Specifications 3542, 3543, 3544 and 3545.
(December 17, 1915)
(Replacing G. E. C. 164)

574 Sleet Storm Data.
(December 27, 1915)
(Supplemented by G. E. C. 617 and 713)

575 Master Specifications for Composite Cable (Non-duplex).
(January 3, 1916)
(Replacing G. E. C. 310)
(Supplemented by G. E. C. 598)

576 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

577 Redesigned 3 by 7 Cordless Private Branch Exchange.
(January 20, 1916)
(Supplementing G. E. C. 195)
(Replacing G. E. C. 198 and 242)

578 Improvements in Design of Central Office Heat Coil.
(March 2, 1916)
(Replacing G. E. C. 106)

579 Sleet Storm Data for U. S. Bureau of Standards.
(January 25, 1916)
(Supplemented by G. E. C. 617)

580 Maintenance of Main Frame Heat Coils and Protector Springs.
(January 28, 1916)

581 Specifications for Dead Oil or Coal Tar for Brush Treatments, etc.
(February 4, 1916)
(Replacing G. E. C. 213, 508 and 512)

582 Private Branch Exchange Switchboard No. 550-A.
(February 3, 1916)
(Replacing G. E. C. 232)
(Replaced in part by G. E. C. 665)

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583 Specifications for Creosoted Yellow Pine and Douglas Fir Crossarms.
(February 7, 1916)
(Supplementing G. E. C. 227)
(Replaced in part by G. E. C. 708)
(Supplemented by G. E. C. 775)

584 Improved Calculagraph.
(February 8, 1916)

585 Sleeve Joints in Copper Line Wire.

586 Protection of Telephone Conductors Leased for the Operation of Signaling Systems other than Telephone.
(February 15, 1916)
(Supplemented by G. E. C. 821 and 1077)

587 Distinguishing Colors for Distributing Frame Wire.
(Replacing G. E. C. 567)
(Replaced by G. E. C. 615)

588 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)
(Referring to G. E. C. 565)

589 Standard No. 49 Jack 7-Panel Subscribers' Sections.
(March 10, 1916)
(Replacing in part G. E. C. 294 and 343)
(Supplementing G. E. C. 189, 292 and 447)
(Replaced in part by G. E. C. 736)

590 Lubrication of No. 1-A Electric Clocks.
(March 1, 1916)

591 No. 1 Residence system.
(March 8, 1916)
(Supplementing G. E. C. 434)

592 Data for Determining the Proper Size of Central Office Storage Batteries.
(March 9, 1916)

593 New Type Metal Subscribers' Set.
(March 6, 1916)
(Supplemented by G. E. C. 1016)

594 Mechanically and Electrically Operated Peg Count Apparatus.
(March 14, 1916)
(Replacing in part T. C. 31)
(Replacing T. C. 32)

595 Guy Shield Plugs.
(March 13, 1916)

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596 Box for Mounting Protectors Outside of Buildings—No. 82-A Protector Mounting.
(March 15, 1916)

597 Duplex Cable.
(March 10, 1916)
(Supplementing G. E. C. 473)

598 Capacity of Paper Insulated Cable—Proposed Change in Method of Measuring.
(March 17, 1916)
(Supplementing G. E. C. 473, 494 and 575)

599 Toll Test Board No. 4.
(March 15, 1916)

600 Switchboard Clocks for Use at "A" Positions.
(March 21, 1916)
(Supplementing G. E. C. 417)

601 Pole and Crossarm Data.
(March 16, 1916)

602 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)
(Referring to G. E. C. 534)

603 Tinned Steel Sleeves.
(Supplementing G. E. C. 96)

604 Standardization of Outside Plant Practices—Placing Underground Cable and Splicing Lead Covered Paper Insulated Cables.
(April 3, 1916)
(Supplementing G. E. C. 453)
(Replacing G. E. C. 538)
(Supplemented by G. E. C. 702, 778 and 938)

605 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

606 Change in Manganese Used for Dry Cell Manufacture.
(April 26, 1916)

607 Telegraph Relay No. 25-A.
(April 25, 1916)

608 Cable Fault Locating Set—Exploring Coil Type.
(April 26, 1916)
(Supplemented by G. E. C. 1071)

609 Method of Placing Aerial Cable Rings.

610 Telegraph Relays Nos. 21-A, 22-A, 23-A and 24-A.
(May 2, 1916)

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611 Cable Paper.
(May 1, 1916)

612 Use of Superimposed Current for Operation of Selective Four-Party Bells.
(May 12, 1916)
(Supplemented by G. E. C. 744)

613 Specifications for Insulator Pins.
(May 5, 1916)
(Replacing G. E. C. 11, 82 and 110)
(Supplemented by G. E. C. 809)

614 Change in Distinguishing Colors on Individual Conductors of Switchboard Cords.
(May 8, 1916)

615 Change in Color Code for Distributing Frame Wire.
(May 11, 1916)
(Supplementing G. E. C. 521)
(Replacing G. E. C. 507 and 587)

616 Specifications for Outside Distributing Wires.
(May 18, 1916)
(Replacing G. E. C. 194, 197, 285 and 566)

617 Wind and Sleet Data for U. S. Weather Bureau.
(May 17, 1916)
(Supplementing G. E. C. 574 and 579)
(Supplemented by G. E. C. 713)

618 Specifications for Break Irons and 5/8" Steel Insulator Pins.
(May 29, 1916)
(Supplementing G. E. C. 431)
(Supplemented by G. E. C. 619)

619 Specifications for the Installation of New Type Break Irons and Old Type Break Irons Equipped with 5/8-Inch Steel Pins.
(May 29, 1916)
(Supplementing G. E. C. 618)

620 Clamps for Small Cables and Ground Wires.

621 Specifications for Inside Wire.
(May 31, 1916)
(Replacing G. C. 75 and 86)

622 Specifications for No. 14 Ground Wire.
(May 31, 1916)
(Supplemented by G. E. C. 875)

623 Redesigned No. 85 Plug.
(May 22, 1916)

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624 Testing Circuit for Toll Line Busy Signals.
(May 23, 1916)

625 Fusing No. 502 Battery Leads.
(May 26, 1916)
(Supplementing G. E. C. 559)

626 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

627 Relay Switchboard No. 1-C—Machine Ringing and Automatic Listening "A" Cord Circuits.
(June 6, 1916)
(Referred to in T. C. 95)

628 Operators' Chairs.
(Supplementing G. E. C. 189 and 399)
(Supplemented by G. E. C. 752)

629 New Method of Connecting Four-Party Selective Extension Bells.
(June 7, 1916)

630 Exposed Cables Entering Central Office and Subscribers' Buildings.
(June 14, 1916)
(Replacing G. E. C. 47)

631 Duplex Rheostat No. 5-A—(Old Number 101, 414).
(June 13, 1916)
(Supplementing Specification 3558)

632 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

633 No. 6-A Rheostat.
(June 19, 1916)
(Supplementing Specification 3558)

634 Transmission Measuring Set.
(June 28, 1916)
(Supplemented by G. E. C. 1034)

635 New Aerial Type 22 Gauge Cable.
(June 14, 1916)
(Supplemented by G. E. C. 852)

636 Resurfacing and Reengraving Call Circuit Key Buttons.
(June 22, 1916)

637 Color Scheme and Arrangement of Cords, Signals and Number Plates for No. 9-C Switchboards.
(June 27, 1916)
(Supplementing G. E. *D.* 540)
(Replaced in Part and Supplemented by G. E. C. 806)

[fol. 15367] 638 Designation Strips.
(June 26, 1916)

639 Large Gauge Cable.
(June 23, 1916)

640 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

641 Discontinuance of Practiee of Grounding Aerial Cable Sheaths.
June 30, 1916)

642 Type "C" Porcelain Knob.
(July 6, 1916)
(Supplemented by G. E. C. 1020)

643 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

644 Standard Traffic Engineering Practices for Local and Toll Central Office Equipment.
(November 13, 1916)
(Supplementing G. E. C. 177)
(Replacing G. E. C. 294)
(Supplemented by G. E. C. 886)
(Replaced in part by T. C. 143)

645 Switches for Duplex Sets.
(July 13, 1916)
(Supplementing Specifications 3558)

646 Automatic Water-Fillers for Storage Batteries.
(July 18, 1916)
(Replacing in part Specifications 3697)

647 Standard Equipment for Trunk Operators' Positions at No. 49 and No. 92 Jack Subscribers' Sections.
(July 26, 1916)
(Replacing in part G. E. C. 144, 294 and 343)
(Replaced in part by G. E. C. 763)
(Supplemented by G. E. C. 884)

648 Tool for Operating "A" Type Cut-off Relays Previous to Cut-Over
(July 27, 1916)

649 Aerial Cable Rings.
(July 29, 1916)
(Supplementing Specifications 3297)

650 Specifications for Ground Rods.
(August 7, 1916)
(Supplemented by G. E. C. 1000)

[fol. 15368]

651 Requirements for 25-foot, Class "C" Cedar Poles.
(August 1, 1916)

652 Inductive Interference from Power Circuits.
(August 10, 1916)
(Supplemented by G. E. C. 738, 821, 900, 901, 904 and 915)
(Replaced in part by G. E. C. 825)

653 No. 14 Type Cable Terminals Equipped with Special Wooden Face Panels.
(August 4, 1916)

654 Standard Intermediate Distributing Frames.
(August 18, 1916)
(Supplementing G. E. C. 395)

655 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

656 Change in Condensers Used in Subscribers' Sets.
(August 21, 1916)
(Supplemented by G. E. C. 740 and 857)

657 Composite Cable.
(August 24, 1916)
(Supplementing G. E. C. 473 and 544)

658 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

659 Discontinuing No. 311 Transmitters.
(August 29, 1916)
(Supplemented by G. E. C. 692)

660 New Breast Plate for Operator's Transmitter No. 234.
(August 30, 1916)

661 Monitoring Circuits.
(September 7, 1916)
(Replacing G. E. C. 509.)

662 New Winding for Nos. 6-A, 7-A and 8-A Ringers.
(September 5, 1916)

663 Tool for Adjusting Middle Spring of No. 125 Type Relays.
(September 11, 1916)

664 Cooperation between Electric Light and Power Industry and Telephone Industry to Reduce Interference.
(September 27, 1916)

665 Private Branch Exchange Switchboard—No. 550-B.
(September 18, 1916)
(Replacing Bulletin 1)
(Replacing in part G. E. C. 582)

[fol. 15369]

666 Improved Tinsel Cords for Use in Testing Circuits.
(September 19, 1916)
(Supplementing G. E. C. 560)

667 Shellac for Dressing Cable Forms.
(September 20, 1916)

668 Central Information Desk No. 1.
(September 29, 1916)
(Supplementing T. C. 63)
(Referring to T. C. 73)

669 Discontinuance of Federal Tax on Telephone Messages.
(September 25, 1916)
(Replacing G. E. C. 492, 495, 499, 504 and 518)

670 Use of Frankel Test Clips.
(October 3, 1916)
(Supplemented by G. E. C. 749)

671 Plugs for Plugging Out Permanent Signals on Magneto Boards and on Common Battery Boards Employing Cut-off Jacks.
(October 4, 1916)

672 Standard Switchboard and Circuit Drawings.
(October 5, 1916)
(Supplementing G. E. C. 250 and 560)

673 Telegraph Repeater No. 3-A
(October 18, 1916)
(Replacing G. E. C. 132)

674 Standardization of Outside Plant Practices—Specifications for the Construction of Toll Pole Lines.
(October 19, 1916)
(Replacing G. E. C. 40, 58 and 115)
(Supplemented by G. E. C. 1010)

675 Standard Main Distributing Frames.
(October 26, 1916)
(Supplementing G. E. C. 358)

676 Connecting Blocks for Use at Substations.
(October 23, 1916)
(Supplementing G. E. C. 352)

677 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

678 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

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679 Reducing Couplings.
(November 10, 1916)
(Supplementing G. E. C. 420)
(Supplemented by G. E. C. 873)

680 Long Nose Pliers with Grooves for Twisting No. 17 B. & S. Copper Sleeves.
(November 9, 1916)

681 Clamps.
(November 13, 1916)

682 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250 and 668)

683 No. 58-A Protector—Asbestos Mat to be Included in Code Number.
(November 15, 1916)

684 Modified No. 137 Plug for Use in Testing and Service Observing Circuits.
(November 16, 1916)

685 Specifications for the Replacement and Reinforcement Inspection of Pole Lines.
(December 20, 1916)
(Supplementing Specifications 3522 and G. E. C. 298)

686 National Electrical Safety Code — United States Bureau of Standards.
(November 16, 1916)
(Supplemented by G. E. C. 750)

687 Specifications KS-4—Requirements for Woodwork and Associated Material for Central Office and P. B. X. Equipments and Specifications KS-5—Requirements for Metal Work and Associated Material for Central Office and P. B. X. Equipments.
(November 23, 1916)

688 Aerial Cable Safety Straps.
(December 5, 1916)
(Replacing Specifications 3263)

689 Standard Switchboard and Circuit Drawings.
(December 1, 1916)
(Supplementing G. E. C. 250 and 425)
(Supplemented by G. E. C. 766)

690 Inspection of Material.
(December 18, 1916)
(Supplementing G. E. C. 354)
(Supplemented by G. E. C. 905)

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691 Steel Desk Stands.
(December 5, 1916)
(Supplemented by G. E. C. 913)

692 Discontinuing No. 311 Transmitters.
(December 4, 1916)
(Supplementing G. E. C. 659)

693 Universal Type Key and Keyshelf.
(December 14, 1916)
(Supplemented by G. E. C. 884)

694 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

695 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250 and 425)

696 Cable Grips.
(January 16, 1917)

697 Guy Anchors—Special Types.
(January 25, 1917)
(Supplemented by G. E. C. 796)

698 Crossarm Bolts and Drive Screws.
(January 26, 1917)

699 Transmitting Specifications No. 3791 for Duct Shields.
(February 8, 1917)
(Replacing Specifications 3218)

700 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250 and 425)

701 Galvanizing of Pole Seats and Balconies.
(Supplementing Specifications 1812, 2437, and 2462)

702 Specifications for Tinned Copper Sleeves for Cable Conductors.
(February 26, 1917)
(Replacing G. E. C. 201)
(Supplementing G. E. C. 604)

703 New Head Band for Operators' Receivers.
(February 20, 1917)

704 Tinsel Cords.
(February 27, 1917)

705 Western Electric Company's Code for Paper Insulated Cables.
(March 2, 1917)

706 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

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707 Preliminary Report by the American Committee on Electrolysis.
(March 20, 1917)

708 Specifications for Fir Crossarms.
(March 26, 1917)
(Replacing in part G. E. C. 244 and 583)
(Supplemented by G. E. C. 775)

709 Legal Department Conference Papers—
(a) The Interstate Commerce Commission Valuation.
(b) Interference Cases.
(March 27, 1917)

710 Use of Tungsten in Place of Carbon Lamps as Resistance Lamps.
(April 3, 1917)
(Replacing in part G. E. C. 331)

711 Specifications for Main Frame Protection.
(April 12, 1917)

712 Handbook of Substation Practice.
(April 7, 1917)
(Supplemented by G. E. C. 770, 791, 823, 837, 838 and 865)

713 Sleet Storm Data.
(April 12, 1917)
(Supplementing G. E. C. 574 and 617)

714 Telephone Repeaters.
(May 21, 1917)
(Supplemented by G. E. C. 812, 826, 876, 883, 891, 892 and 971)

715 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

716 Telephone Service at Army Mobilization Camps.
(Replaced by G. E. C. 719)

717 Rubber Tube Protectors for No. 87 Operators' Cords.
(May 3, 1917)

718 No. 4-A Foot Switch for Transmitter Cut-out.
(May 4, 1917)

719 Telephone Service at Army Mobilization Camps.
(Replacing G. E. C. 716)
(Supplemented by G. E. C. 722 and 739)

720 Specifications for Rubber Insulated Lead Covered Cable.
(May 31, 1917)

721 Specifications for Creosoted Yellow Pine Poles.
(May 24, 1917)

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722 Telephone Service at Army Mobilization Camps.
(May 12, 1917)
(Supplemented by G. E. C. 733, 739 and 756)

723 Braided Black Enameled Switchboard Wire.
(May 17, 1917)
(Supplemented by G. E. C. 761)

724 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

725 Specifications for Insulating Tape.
(May 28, 1917)
(Supplemented by G. E. C. 804)

726 Switchboard Lighting.
(June 4, 1917)
(Supplementing G. E. C. 124, 166 and 482)

727 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

728 The Butt Treatment of Poles.
(Supplementing G. E. C. 56)

729 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

730 Installation of "Building-out" Condensers on Open Wire Lines—Specifications No. 3880
(June 29, 1917)
(Replaced in part by G. E. C. 919)
(Supplemented by G. E. C. 924)

731 Report of Telephone Company Activities in Connection with Government Matters.

732 Amendment to Specifications No. 3211—"Stub Reinforcement for Poles."
(June 27, 1917)
(Supplementing G.—C. 81)
(Supplemented by G. E. C. 734 and 792)

733 Telephone Service at Army Mobilization Camps.
(June 27, 1917)
(Supplementing G. E. C. 722)
(Supplemented by G. E. C. 756)

734 Correction of G. E. C. No. 732, Amendment to Specifications No. 3211, "Stub Reinforcement for Poles".
(July 12, 1917)
(Supplementing G. E. C. 732)

735 Double Tube Copper Sleeves.

736 Semi-hard Black Rubber in Place of Leather as a Covering for Piling Blocks and Keyshelf Lamp Rails.
(July 23, 1917)
(Replacing in part G. E. C. 589)

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737 Colored Lamp Caps.
(July 25, 1917)
(Supplemented by G. E. C. 1056)

738 Exposed Line Transposition System.
(August 16, 1917)
(Supplementing G. E. C. 563 and 652)
(Replacing in part G. E. C. 563)
(Supplemented by G. E. C. 816, 871, 915 and 918)

739 Substation Equipment for Army Mobilization Camps.
(August 14, 1917)
(Supplementing G. E. C. 722)

740 Use of 1 Microfarad Condenser in Four-Party Relay Sets.
(August 15, 1917)
(Supplementing G. E. C. 656)
(Supplemented by G. E. C. 857)

741 Strain Insulators for Long Span River Crossings.
(August 28, 1917)
(Replacing Specifications 2077 and 2292)

742 Portable Capacity Bridge.
(August 30, 1917)

743 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

744 Method of Obtaining Ringing Current from Central Office Storage Batteries.
(September 4, 1917)
(Supplementing G. E. C. 612)

745 Specifications for Telephone Power Machines.
(September 7, 1917)
(Replacing G. E. C. 123, 344 and 384)
(Replaced in part by G. E. C. 817)

746 Modification of "A" Operator's Cord Circuit to Facilitate Testing Outgoing Trunk Assignments.
(November 5, 1917)

747 Magneto Switchboard No. 105-B.
(October 10, 1917)
(Supplementing G. E. C. 174 and 565)

748 No. 35 Battery Gauge.
(September 10, 1917)
(Supplementing G. E. C. 246)

749 Test Clips.
(September 6, 1917)
(Supplementing G. E. C. 670)

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750 National Electrical Safety Code.
(September 17, 1917)
(Supplementing G. E. C. 686)
(Supplemented by G. E. C. 814)

751 Substation Protection Specifications.
(September 19, 1917)
(Supplemented by G. E. C. 968)

752 1916 Standard Operator's Chair.
(Supplementing G. E. C. 628)

753 Standard Switchboard and Circuit Drawings.
(Supplementing G. E. C. 250)

754 Mercury Arc Rectifiers for Charging Storage Batteries.
(October 26, 1917)
(Supplementing and replacing in part G. E. C. 542)

755 Standard Power Plant Circuit Conventions.
(October 31, 1917)

756 Telephone Service at Army Mobilization Camps.
(October 18, 1917)
(Supplementing G. E. C. 722 and 733)

757 Standardization of Outside Plant Practices—Specifications for the Construction of Wood Pole Lines Used Jointly for Supply Circuits and Signal Circuits.
(Replacing G.—C. 46)

758 Improved Transmitter for Substation Service.
(October 29, 1917)
(Supplemented by G. E. C. 838)

759 Amendment No. 2 to Specifications No. 3550—Steel Pins for Transposition Brackets.
(November 28, 1917)

760 Strand Connectors.
(December 17, 1917)

761 Protection of Central Offices—Distributing Frame Wire.
(December 13, 1917)
(Supplementing G. E. C. 479 and 723)
(Supplemented by G. E. C. 957 and 1048)

762 Enameled Wire Switchboard Cable.
(December 14, 1917)
(Supplementing G. E. C. 461)

763 Location of the Prepayment Coin Box Service Buttons on Mechanically Locking Keys for Toll Switching Trunks.
(December 24, 1917)
[fol. 15376] (Replacing in part G. E. C. 548 and 647)

764 Meters for Telephone Power Plants.
(December 21, 1917)
(Supplemented by G. E. C. 817)

765 Improvements in Call Circuits and Trunk Operators' Telephone Sets.
(December 27, 1917)
(Replacing in part G. E. C. 271)

766 Standard Switchboard and Circuit Drawings.
(December 20, 1917)
(Supplementing G. E. C. 250, 425 and 689)

767 Connecting Blocks for Nos. 4, 5 and 6 Cable Terminals.
(December 19, 1917)
(Supplementing Specifications 2078)

768 Cable Terminals for Use in Buildings—Standardization of No. 23 Type Cable Terminals, No. 4 Type Distributing Rings and No. 4 Fanning Strips.
(December 26, 1917)
(Supplementing G. E. C. 228 and 415)

769 Step for Use on the Diagonal Brace of Extension Fixtures.
(January 4, 1918)
(Supplementing Specifications 3076)

770 Handbook of Substation Practices—Specifications for Substation Sign Installation.
(January 9, 1918)
(Supplementing G. E. C. 712)
(Supplemented by G. E. C. 862)

771 Short Lengths of Inside Wire.
(Supplementing G. E. C. 621)

772 Standardization of Outside Plant Practices—Specifications 3930. "Drop Wiring".
(January 17, 1918)
(Supplemented by G. E. C. 774, 790, 820, 843 and 881)

773 Location of Supervisors' Equipment on Additions to No. 1 Subscribers' and Trunk Switchboards.
(January 14, 1918)
(Replacing in part G. E. C. 447 and 548)

774 New Materials for Drop Wiring.
(January 28, 1918)
(Supplementing G. E. C. 772)

775 Supply of Crossarms.
(January 31, 1918)
(Supplementing G. E. C. 227, 583 and 708)

776 Use of Explosives.
(April 4, 1918)
(Supplemented by G. E. C. 932)

[fol. 15377]

777 Standard Message Register Racks and Casings—Change in Type of Lock for Sliding Doors.
(February 14, 1918)
(Supplementing G. E. C. 537)

778 Standardization of Outside Plant Practices—Specification 3912 "General Cable Splicing," Specifications 3913 "Underground Cable Splicing" and Specifications 3914 "Aerial Cable Splicing".
(February 11, 1918)
(Supplementing G. E. C. 604)
(Supplemented by G. E. C. 779, 781, 789, 815, 818, 819, 906, 907, 914, 966, 967, 969, 1012 and 1047)

779 Manhole Shields.
(February 15, 1918)
(Supplementing G. E. C. 778)

780 Specifications for Solder.
(February 21, 1918)
(Supplementing G. E. C. 222)

781 Standardization of Outside Plant Practices—Specifications No. 3915 "Block Cable Splicing" and Specifications No. 3916 "House Cable Splicing."
(February 18, 1918)
(Supplementing G. E. C. 778)
(Supplemented by G. E. C. 818)

782 Gas Engines.
(March 1, 1918)

783 Fire Protection—General Precautions and Protective Apparatus.
(March 4, 1918)
(Replacing Special Bulletin A)
(Supplementing G. E. C. 182 and T. C. 50)
(Supplemented by G. E. C. 803)

784 Methods for Supporting and Protecting Conductors at High Tension Crossings.
(March 6, 1918)
(Supplementing G. E. C. 528)

785 Specifications for High Tension Crossings.
(February 28, 1918)
(Replacing G. E. C. 203)
(Supplementing G. E. C. 528)

786 Reinforcing Links.
(March 21, 1918)

787 No. 1-D Switchboard Equipment.
(April 30, 1918)
(Supplemented by G. E. C. 817)

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788 Joint Use of Poles.
(March 21, 1918)

789 Splicers' Contact Points.
(March 28, 1918)
(Supplementing G. E. C. 778)

790 Materials for Drop Wiring.
(April 12, 1918)
(Supplementing G. E. C. 772)

791 One-half Inch Drive Ring.
(April 16, 1918)
(Supplementing G. E. C. 712)

792 Specifications for Creosoted Pine Stubs.
(April 15, 1918)
(Supplementing G. E. C. 732)

793 Specifications for Vitrified Clay Sewer Pipe.
(April 17, 1918)
(Supplementing G. E. C. 386)

794 List of Standard Specifications.
(Replacing G. E. C. 336)

795 Specifications for 2200 Pound Strand.
(April 19, 1918)

796 Patent Guy Anchors.
(April 22, 1918)
(Supplementing G. E. C. 697)
(Supplemented by G. E. C. 1064)

797 Location of Incoming Call Circuit Grouping Keys.
(April 23, 1918)
(Supplementing G. E. C. 271)

798 Binding Posts for Battery and Ground Supply at Floor Type Main Distributing Frames.
(April 24, 1918)
(Supplementing G. E. C. 358)

799 Hand Magazines for Dynamite and Electric Blasting Caps.
(April 24, 1918)

800 Specifications for Wooden Pole Steps and Wooden Pole Brackets.
(April 26, 1918)
(Replaced in part by G. E. C. 1072)

801 Blue Bell Batteries.
(May 1, 1918)

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802 Return of Exhausted Material from No. 502 Primary Batteries.
(May 2, 1918)
(Supplementing G. E. C. 559)

803 Fire Prevention and Protection in Connection with the Construction of Telephone Buildings.
(May 15, 1918)
(Supplements G. E. C. 783)

804 Specifications for Friction Tape.
(May 14, 1918)
(Supplementing G. E. C. 725)

805 Electrolysis.
(May 13, 1918)

806 Color of Cords, Plug Shells, Key Buttons and Associated Lamp Caps for Central Office and Private Branch Exchange Equipments.
(March 17, 1918)
(Replacing in part and supplementing G. E. C. 79, 540 and 837)

807 Manhole Ladders.
(May 23, 1918)
(Supplemented by G. E. C. 921)

808 Peg Count Register Key.
(May 20, 1918)
(Replacing in part G. E. C. 343)
(Supplemented by G. E. C. 1065)

809 Locust Insulator Pins.
(May 20, 1918)
(Supplementing G. E. C. 613 and Specifications 3348)

810 List of Circular Letters & Bulletins.
(Replacing G. E. C. 342)

811 Telephone Equipment in Connection with the General Consolidation of Railroad Ticket Offices.
(May 22, 1918)

812 Telephone Repeaters.
(June 17, 1918)
(Supplementing G. E. C. 714)
(Supplemented by G. E. C. 826, 876 and 926 and T. C. 132)

813 Moisture-proof Desk Stand Cord.
(June 11, 1918)
(Supplemented by G. E. C. 827)

814 High Tension Joint Use.
(June 12, 1918)
(Supplementing G. E. C. 750)

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815 Specifications for Paraffin.
(June 28, 1918)
(Supplementing G. E. C. 778)

816 Paper on Design of Transpositions.
(June 24, 1918)
(Supplementing G. E. C. 738)

817 Standard Power Plants for No. 1-D Central Office Equipment.
(August 15, 1918)
(Supplementing G. E. C. 457, 764 and 787)
(Replacing in part G. E. C. 745)
(Supplemented by G. E. C. 856 and 878)

818 Materials for Cable Work.
(July 18, 1918)
(Supplementing G. E. C. 778 and 781)

819 Resistance Unbalance in Small Gauge Cable Circuits Either Quadded or for Toll Use—Soldering the Joints.
(July 10, 1918)
(Supplementing G. E. C. 778)
(Supplemented by G. E. C. 914)

820 Machine Bolt.
(July 30, 1918)
(Supplements G. E. C. 772)

821 Inductive Interference from Western Union Telegraph Circuits.
(July 23, 1918)
(Supplementing G. E. C. 586 and 652)

822 Standardization of Outside Plant Practices—Specifications No. 3931—"Block Cable Construction".
(July 25, 1918)
(Replacing in part specifications 3235)
(Supplemented by G. E. C. 829, 832 and 1047)

823 Handbook of Substation Practice—Telegraph Substation Installation.
(July 24, 1918)
(Supplementing G. E. C. 712)
(Supplemented by G. E. C. 923)

824 Twisted Pair Rubber covered Wire — Recommended Change in Practice to meet War Requirements.
(Supp. G. E. C. 858, G. E. C. 867)

825 Consecutive X Sections.
(August 13, 1918)
(Replacing in part G. E. C. 652)

826 Telephone Repeater Balance Requirements.
(August 22, 1918)
(Supplementing G. E. C. 714 and 812)
(Supplemented by G. E. C. 869, 926 and 999)
(Replaced in part by G. E. C. 919)

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827 Moisture-proof and Brown Telephone Cords.
(August 20, 1918)
(Supplementing G. E. C. 813)

828 Two-frequency Four-party Selective Ringing System.
(September 5, 1918)

829 Wire Rope Clamp.
(August 26, 1918)
(Supplementing G. E. C. 822)

830 Transmitting Preliminary Draft of First Aid Instructions.
(August 29, 1918)

831 Specifications for Tree Blocks.
(August 27, 1918)

832 Loop Straps.
(August 28, 1918)
(Supplementing G. E. C. 822)

833 Audible Busy Signal for "B" Switchboards.
(September 3, 1918)

834 Specifications for Storage Batteries—Chloride Accumulator Type.
(September 9, 1918)
(Replacing G. E. C. 562)

835 Registry of Water Stills for Storage Batteries.
(September 23, 1918)

836 Method of Making Short Multiple Cable Taps.
(August 30, 1918)

837 Inside Wiring Cleats.
(September 6, 1918)
(Supplements G. E. C. 712)

838 Handbook Specifications No. 3852—Substation Apparatus Installation—Supplement A.
(September 10, 1918)
(Supplementing G. E. C. 712 and 758)

839 New Type Relays to Replace the No. 122 and Similar Relays.
(September 12, 1918)

840 No. 2 Type Lamps for Pilot Signals.
(September 11, 1918)

841 Conversion of No. 84-B to No. 84-E Interrupters.
(September 16, 1918)
[fol. 15382] (Supplementing G. E. C. 381)

842 Inside Wire.
(October 1, 1918)
(Replacing G. E. C. 771)

843 Insulated Screw Eye—Open Type.
(October 15, 1918)
(Supplementing G. E. C. 772)

844 Handbook Covers.
(October 14, 1918)

845 Galvanized Finish for No. 61 Protector Mounting.
(October 17, 1918)

846 Audible Ringing Signal.
(October 24, 1918)
(Supplemented by G. E. C. 1014)

847 Defective Insulation in Rubber Potheads.
(October 23, 1918)

848 Repair of Tinsel Switchboard Cords.
(October 28, 1918)
(Supplementing G. E. C. 429)

849 Toll Test Board No. 4—Improved Open Location Test Circuit.
(November 4, 1918)
(Replacing G. E. C. 167)

850 Composite Ringer Sets—Testing and Adjusting Circuits.
(November 6, 1918)

851 Specifications No. 3778 for 1212—Pair No. 24 Gauge Cable.
(October 29, 1918)
(Supplemented by G. E. C. 996)

852 New Aerial Type No. 22 Gauge Cable—Specifications No. 3800.
(October 31, 1918)
(Replacing G. E. C. 388)
(Supplementing G. E. C. 635)

853 Strand Reel Jack.
(November 27, 1918)

854 Standard Fuse Boards and Subscribers' and Trunk Coil Racks.
(November 15, 1918)
(Supplementing G. E. C. 501)
(Supplemented by G. E. C. 1053)

855 Toll Switchboard No. 2 and Rural Positions at No. 1 Subscribers' Sections.
(November 18, 1918)
(Replacing G. E. C. 48)
(Supplementing G. E. C. 263)

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856 Dry Battery Cabinets.
(November 14, 1918)
(Supplementing G. E. C. 546 and 817)

857 Condensers Used in Subscribers' Sets.
(November 1, 1918)
(Supplementing G. E. C. 656 and 740)

858 Wire for Subscribers Drops.
(Supp. G. E. C. 824)
(Supp. by G. E. C. 867)

859 Contact Material for Telephone Apparatus.
(November 19, 1918)

860 Improved Recall Signals.
(December 27, 1918)

861 Inspection and Testing of the Cable Plant.
(December 31, 1918)

862 Substation Sign Installation—Materials.
(December 13, 1918)
(Supplementing G. E. C. 770)

863 Main Line Telegraph Sounder No. 15-B.
(November 26, 1918)

864 Waxed Switchboard Cords.
(November 25, 1918)
(Supplementing G. E. C. 376)

865 Station Ground Wire Moulding.
(December 12, 1918)
(Supplementing G. E. C. 712)

866 New Finish for Desk Stands.
(November 27, 1918)
(Supplemented by G. E. C. 965)

867 Supplement "A" to Specification 3930—"Drop Wiring".
(Supp. G. E. C. 824 G. E. C. 858)

868 Aerial Cable Guy Rule.

869 Telephone Repeaters Balance Requirements—Revision.
(Supp. G. E. C. 826)

870 Correctness of Loading Testing Set.
(January 30, 1919)

871 Specifications No. 3897—"Preliminary Specifications for Locating Telephone Circuit Transpositions—Exposed Line Transposition System" in Handbook Form.
(December 9, 1918)
(Supplementing G. E. C. 738)

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872 Pipe Ripper.
(January 8, 1919)

873 Castings for Underground Construction.
(December 30, 1918)
(Supplementing G. E. C. 420 and 679)

874 Cable Racks and Hooks.
(January 24, 1919)
(Supplementing G. E. C. 386)

875 No. 14 Ground Wire.
(January 16, 1919)
(Supplementing G. E. C. 662)

876 Portable Cord Circuit Repeater Set.
(January 27, 1919)
(Supplementing G. E. C. 714 and 812)

877 Improper Arrangement of Gas Engine Exhaust Piping.
(January 28, 1919)

878 Electrical Starting of Gas Engines.
(February 5, 1919)
(Supplementing G. E. C. 817)

879 Lithoprint Process of Making Prints and Tracings.
(February 4, 1919)

880 Local Operating Room Desks.
(April 15, 1919)

881 Materials for Drop Wiring.
(February 7, 1919)
(Supplementing G. E. C. 772)

882 Proposed Standard Symbols for Outside Plant.

883 101-B Repeater Bulb—Change in Construction.
(February 14, 1919)
(Supplementing G. E. C. 714)

884 Narrow Base Keys for Manual Ringing Trunks.
(February 21, 1919)
(Supplementing G. E. C. 647 and 693)

885 Cable Reel Trailers.
(March 21, 1919)

886 Standard Traffic Engineering Practices for Local and Toll Central Office Equipments.
(March 11, 1919)
(Supplementing G. E. C. 644)

887 Timing Devices at Recording Boards.
(March 24, 1919)

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888 New Type of Blue Bell Battery.
(March 27, 1919)

889 Tin Coating on Copper Wire.
(April 1, 1919)

890 Pole Dinkeys.
(March 31, 1919)

891 Telephone Repeaters—Improved 21—Circuit Test for Balance.
(March 28, 1919)
(Supplementing G. E. C. 714)
(Supplemented by G. E. C. 1029)

892 Telephone Repeater Equipment—Space Battery Alarm Circuit.
(April 4, 1919)
(Supplementing G. E. C. 714)

893 Repair Clerk's Desk No. 1.
(April 11, 1919)
(Replacing in part G. E. C. 552)

894 Message Register Keys.
(April 7, 1919)

895 Jack Space for Use with No. 118 Lamp Socket Mounting.
(April 9, 1919)

896 Modified No. 25 Tool.
(April 3, 1919)

897 Machine for Boring Pole Holes.
(April 16, 1919)
(Supplemented by G. E. C. 950)

898 Toll Test Board No. 4—Morse Board No. 4.
(June 30, 1919)
(Replacing G. E. C. 233)
(Supplemented by G. E. C. 1053)

899 Decimal Timer Split-Second Stop Watch.
(April 22, 1919)
(Replacing T. C. 10)
(Supplemented by G. E. C. 925)

900 Telephone Interference Factor of Power Voltages.
(May 2, 1919)
(Supplementing G. E. C. 652)
(Supplemented by G. E. C. 1075)

901 Final Report of the Joint Committee on Inductive Interference and General Order No. 52 of the Railroad Commission of the State of California.
(April 29, 1919)
(Supplementing G. E. C. 652)

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902 Standardization of Outside Plant Practices.—Specifications No. 3929—"Aerial Cable Construction".
(June 9, 1919)
(Replacing in part specifications 3235)
(Supplemented by G. E. C. 908, 911, 909, 1010, 1019 and 1047)

903 Standardization of Outside Plant Practices.—Specifications No. 3933—"House Cable Placing."
(May 23, 1919)
(Supplemented by G. E. C. 1047)

904 Portable Resonant Wave Analyzer.
(June 10, 1919)
(Supplementing G. E. C. 652)

905 Inspection of Material.
(June 3, 1919)
(Supplementing G. E. C. 690)

906 Pipe Caps and Pipe Cap Molds.
(June 16, 1919)
(Supplementing G. E. C. 778)
(Supplemented by G. E. C. 1018)

907 Specifications for Cotton Sleeving.
(June 19, 1919)
(Supplementing G. E. C. 778)
(Supplemented by G. E. C. 974)

908 Rope Mat.
(June 20, 1919)
(Supplementing G. E. C. 902)

909 Aerial Cable Guide.
(June 21, 1919)
(Supplementing G. E. C. 902)

910 Wire Type Head Bands for Operators' Receivers.
(June 11, 1919)

911 Trolley and Tree Guards.
(June 17, 1919)
(Replacing in part G. E. C. 274)
(Supplementing G. E. C. 902)
(Replaced in part by G. E. C. 973)

912 Change in A1S Blackburn Ground Clamps.
(June 13, 1919)
(Supplemented by G. E. C. 1040)

913 Use of Steel Desk Stands to Obtain Maintenance Economies.
(July 2, 1919)
(Supplementing G. E. C. 691)

914 Standardization of Outside Plant Practices—Specifications No. 3912—General Cable Splicing, Supplement A.
(July 3, 1919)
(Supplementing G. E. C. 778 and 819)

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915 Coefficients of Induction Between Power Circuits and Telephone Circuits.
(March 19, 1920)
(Supplementing G. E. C. 652 and 738)

916 No. 8 Cable Terminals.
(July 14, 1919)

917 Nos. 26 and 27 Protector Blocks.
(July 28, 1919)
(Supplemented by G. E. C. 935)

918 "Square Phantom" Telephone Circuits.
(July 31, 1919)
(Supplementing G. E. C. 738)

919 Standardization of Open Wire and Office Type Building-out Condensers.
(August 13, 1919)
(Replacing in part G. E. C. 730 and 826)

920 Transmitting Specifications No. 4018—First Aid.
(September 2, 1919)

921 Manhole Ladders.
(September 18, 1919)
(Supplementing G. E. C. 807)

922 New Induction Coil for Subscribers' Sets.
(October 7, 1919)

923 Telegraph Sounders No. 3-B and No. 3-C—Code Numbers.
(October 10, 1919)
(Supplementing G. E. C. 823)

924 Installation of "Building-out" Condensers on Open Wire Lines—Specifications No. 4024, Supplementing Specifications No. 3880.
(October 29, 1919)
(Supplementing G. E. C. 730)

925 Hundred Second Timer—100 Second Dial Split Second Stop Watch Direct Reading in Seconds.
(December 8, 1919)
(Supplementing G. E. C. 899)

926 Tandem Operation of Telephone Repeaters.
(December 18, 1919)
(Supplementing G. E. C. 812 and 826)

927 New Operator's Receiver.
(December 26, 1919)

928 Standardization of Outside Plant Practices.—Specifications Nos. 4033—Tree Pruning.
(December 30, 1919)
(Replacing G. E. C. 346 and Specifications 4002)

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929 Furnace Shield.
(January 14, 1920)

930 Specifications No. 4036 "Thimbles."
(January 15, 1920)
(Replacing Specifications 3077)
(Supplementing G. E. C. 276)

931 Clamps for Cables and Ground Wires.
(January 19, 1920)
(Replacing G. E. C. 620)
(Supplemented by G. E. C. 958)

932 Handling of Explosives.
(January 13, 1920)
(Supplementing G. E. C. 776)

933 Use of Series Multiple Pothead on Jointly Used Poles.
(January 23, 1920)

934 Standardization of "B Cable Terminal".
(January 21, 1920)

935 Nos. 26 and 27 Protector Blocks—Reduced Substation and Central Office Maintenance.
(January 26, 1920)
(Supplementing G. E. C. 917)

936 Paper on Telephone Repeaters.
(January 22, 1920)

937 U Cable Guards.
(January 30, 1920)

938 Standardization of Outside Plant Practices—Specifications No. 4032, "Underground Cable Placing."
(January 27, 1920)
(Supplementing G. E. C. 604)

939 Floor Outlet for Protecting Inside Wires and Cables.
(February 13, 1920)
(Supplementing specifications 3853)

940 Requirements for Repaired Gondensers Employing Paper Dielectric.
(February 10, 1920)

941 Line Impedance Measuring Apparatus.
(February 16, 1920)
(Supplemented by G. E. C. 1062)

942 C. S. Ground Clamp.

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943 Specifications for Insulator Pins.
(February 18, 1920)

944 Cable Balconies and Pole Seat.
(February 19, 1920)
(Replacing specifications 1812, 2437 and 2462 and G. E. C. 701)
(Supplemented by G. E. C. 991 and 1019)

945 Designation of Wires and Sleeves.

946 Supply of Types F, G, and U Cables.
(March 15, 1920)

947 Standardization of Outside Plant Practices.—Specifications No. 3932—"Block Wiring."
(March 16, 1920)
(Replacing in part specifications 3235)

948 Standard Symbols for Outside Plant.
(March 17, 1920)
(Replacing G. E. C. 882)

949 Wooden Pole Brackets and Pole Steps.
(March 19, 1920)
(Replaced in part by G. E. C. 1072)

950 Earth Boring Machines.
(April 5, 1920)
(Supplementing G. E. C. 897)

951 Transmitting Specifications No. 4006—Transposition Glass Insulators.
(April 6, 1920)

952 No. 6F Connecting Block (13 pair) and No. 6 Fanning Strip (13 Pair).
(April 7, 1920)

953 Eye Bolts and Eye Nuts.
(April 12, 1920)

954 Grade Clamps.
(April 29, 1920)

955 B Booster Hook.
(April 30, 1920)

956 Transmitting Specifications and Drawings for B, C and D First Aid Kits.
(May 17, 1920)
(Supplemented by G. E. C. 1015)

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957 Distributing Frame Wire.
(May 3, 1920)
(Supplementing G. E. C. 761)
(Supplemented by G. E. C. 998)

958 Bridle Rings for Cable Clamps.
(May 4, 1920)
(Supplementing G. E. C. 931)

959 Magneto Subscribers' Sets Employing 2500-ohm Ringers of the No. 8 Type.
(May 5, 1920)

960 Cable Extension Arms.
(May 6, 1920)

961 Thimble Guy Rods.

962 Porcelain Strain Insulators.
(May 18, 1920)

963 Reinforcing Strap.
(May 14, 1920)

964 Transmitting Specifications No. 4069, "Houseline."
(May 19, 1920)

965 Substation Equipment—General Use of Black Finish.
(May 11, 1920)
(Supplementing G. E. C. 866)

966 Standardization of Outside Plant Practices—Specifications No. 3912—General Cable Splicing—Wax Thermometer.
(May 24, 1920)
(Supplementing G. E. C. 778)

967 Standardization of Outside Plant Practices—Specifications No. 3914—Aerial Cable Splicing. Supplement A.
(June 1, 1920)
(Supplementing G. E. C. 778)

968 New Substation Protector—For Use Where Lines Enter Substations in Cable.
(June 4, 1920)
(Supplementing specifications 3850 and G. E. C. 751)

969 Standardization of Outside Plant Practices—Specifications No. 3914—Aerial Cable Splicing—Splicers' Tent.
(May 28, 1920)
(Supplementing G. E. C. 778)

970 Bridle Wire Insulator.
(June 7, 1920)
(Replacing G. E. C. 190)

971 Vacuum Tube Repeater Sockets.
(June 3, 1920)
(Supplementing G. E. C. 714)

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972 Modifications of No. 4-A Buzzer.
(June 11, 1920)
(Supplementing G. E. C. 465)

973 Trolley Guards.
(June 14, 1920)
(Replacing in part G. E. C. 911)

974 Specifications for Cotton Sleeving.
(June 15, 1920)
(Supplementing G. E. C. 907)

975 Standardization of Outside Plant Practices.—Specifications No. 4040 "Construction of Jointly Used Wood Pole Lines."
(June 17, 1920)
(Replacing G. E. C. 757 and specifications 3921)

976 Specifications No. 3935—New Designations for Wires and Sleeves.
(June 23, 1920)
(Replacing G. E. C. 945)

977 Carrying Case for Protector Blocks.
(June 25, 1920)

978 Discontinuing Specifications No. 3930 "Drop Wiring" Supplement "A".
(June 28, 1920)
(Replacing G. E. C. 824, 858 and 867)

979 Bulletin on Sags and Tensions of Suspension Strand for Aerial Cable.
(June 29, 1920)

980 Spout Strap.
(June 26, 1920)

981 Cable Terminal Wire.
(June 30, 1920)

982 Non-Multiple Private Branch Exchange Switchboards for Operation with Machine Switching Central Offices.
(July 1, 1920)
(Supplemented by G. E. C. 997 and 1036)

983 Pulling Up Clamp.
(July 12, 1920)

984 Rock Guy Anchors.
(July 19, 1920)

985 (Discontinuing Specifications No. 2770).
(July 21, 1920)

986 Underground Conduit Construction—Specifications 4104 "Creosoted Wood Conduit", and Specifications 4105, "Creosoted Plank".
(July 22, 1920)
(Supplementing G. E. C. 24 and —)

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987 Substation Installation—Improved Inside Wiring Nail.
(August 27, 1920)

988 Machine Switching Substations—Transmitting Preliminary Specifications No. 4100.
(August 27, 1920)
(Supplemented by G. E. C. 1011, 1013 and 1078)

989 Steel Cable Crossarm.
(August 27, 1920)

990 Specifications for Dowel Pins.
(August 30, 1920)

991 Braces for F. X. Terminals.
(September 24, 1920)
(Supplementing G. E. C. 944)
(Supplemented by G. E. C. 1019)

992 Central Office Names for Use in Machine Switching Exchanges.
(September 30, 1920)

993 Body Belt and Safety Strap.
(September 27, 1920)

994 Magnet Substations—Abandoning the No. 12-A and 12-AP Protectors.
(October 8, 1920)

995 No. 317 Magneto Type Subscribers' Sets—Use of Desk Stand Transmitter.
(October 1, 1920)

996 24 Gauge Cable.
(October 15, 1920)
(Supplementing G. E. C. 851)

997 Non-Multiple Private Branch Exchange Switchboards for Operation with Machine Switching Central Offices—No. 550-SC Switchboard.
(October 27, 1920)
(Supplementing G. E. C. 982)

998 Distributing Frame Wire—Amendment No. 1 to Specifications 4056.
(November 3, 1920)
(Supplementing G. E. C. 957)
(Supplemented by G. E. C. 1048)

999 Precision Type Basic Networks.
(November 5, 1920)
(Supplementing G. E. C. 826)

1000 Ground Rods.
(December 13, 1920)
(Supplementing G. E. C. 650)

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1001 Pipe Straps.
(November 30, 1920)

1002 Standard Operators' Chairs.
(December 1, 1920)
(Replacing G. E. C. 628 and 752)
(Supplementing G. E. C. 189)

1003 Changes in Subscribers' Numbers in the Series 1 to 999 Due to Introduction of Machine Switching Equipment.
(December 20, 1920)

1004 Modifications in Cord Equipment at Outward Toll Positions.
(December 18, 1920)

1005 Machine Switching Publicity Memoranda—Initial Zeros. General Information for All Employes.
(December 23, 1920)

1006 Changes in No. 135 Plug.
(December 28, 1920)

1007 Cable Suspension Clamps.
(January 11, 1921)
(Supplementing specifications 3326)

1008 Manhole Guard.
(January 3, 1921)

1009 Glass Insulators.
(January 10, 1921)
(Replacing G. E. C. 160)

1010 Standardization of Outside Plant Practices.—Spec. No. 3927 "Guying".
(January 13, 1921)
(Supplementing G. E. C. 165, 674 and 902)

1011 Machine Switching Substations—Instruction Cards for Dials.
(January 15, 1921)
(Supplementing G. E. C. 988)

1012 Standardization of Outside Plant Practices—Specifications No. 3912—"General Cable Splicing." Supplement B.
(January 15, 1921)
(Supplementing G. E. C. 778)

1013 Machine Switching Substations—Installing Subscribers' Sets with Dial.
(January 17, 1921)
(Supplementing G. E. C. 988)

1014 No. 59 Type Condensers.
(January 19, 1921)
(Supplementing G. E. C. 846)

1015 "B" First Aid Box.
(January 17, 1921)
(Supplementing G. E. C. 956)

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1016 Metal Subscribers' Sets.—New Writing Shelf.
(January 21, 1921)
(Supplementing G. E. C. 593)

1017 Outline of Special Work in Connection with the Cutover of a Machine Switching Office.
(January 25, 1921)

1018 Pipe Cap Molds.
(February 17, 1921)
(Supplementing G. E. C. 906)

1019 Standardization of Outside Plant Practices—Specifications No. 3929, Appendix 1—Aerial Cable Construction—Use of B and C Cable Balconies with FX Terminals.
(January 27, 1921)
(Supplementing G. E. C. 902, 944 and 991)

1020 Type C Porcelain Knobs.
(February 1, 1921)
(Supplementing G. E. C. 642)

1021 Standardization of Outside Plant Practices—Specifications No. 4131—Use of Dynamite.
(February 1, 1921)
(Replacing G. E. C. 489)

1022 Specifications for Chestnut Poles.
(February 3, 1921)

1023 Cutover of Machine Switching Offices—Temporary Operator's Positions.
(February 7, 1921)
(Supplemented by G. E. C. 1058)

1024 Standardization of Outside Plant Practices—Specifications No. 3930, Drop Wiring, Appendix 1—Multiple Fusing in Underground Cable Terminals.
(February 9, 1921)

1025 Reduction in Thickness of Cable Sheath.
(February 18, 1921)

1026 Sleeve Twisters.
(February 15, 1921)

1027 Tinned Steel Sleeves.
(February 23, 1921)
(Replacing G. E. C. 603)

1028 Transposition Running Board.
(February 16, 1921)

1029 Telephone Repeaters—Improved 21 Circuit Test.
(February 15, 1921)
[fol. 15395] (Supplementing G. E. C. 891)

1030 Guy Rule.
(February 19, 1921)
(Replacing G. E. C. 868)

1031 Carrier Current Systems.
(February 11, 1921)
(Supplemented by G. E. C. 1046)

1032 W. P. Wire.
(February 24, 1921)
(Replacing G. E. C. 234)

1033 Transmission Testing Apparatus—Coding System.
(February 25, 1921)

1034 Use of 1-A Transmission Measuring Set by Railroad Companies and Connecting Telephone Companies.
(February 25, 1921)
(Supplementing G. E. C. 634)

1035 Copper Wire and Sleeves.
(March 4, 1921)
(Replacing G. E. C. 735)

1036 Maintenance Information Covering Private Branch Exchange Switchboard No. 550-C.
(March 29, 1921)
(Supplementing G. E. C. 982)

1037 Telephone Service Between the United States and Cuba.
(February 26, 1921)

1038 Specifications for Muslin.
(March 15, 1921)

1039 C. L. Tree Wire.
(March 21, 1921)

1040 A I S Ground Clamp—Change in Size of Locknut.
(March 16, 1921)
(Supplementing G. E. C. 912)

1041 Bridle Rings.
(March 22, 1921)

1042 Mechanical Toll Ticket Distributing System.
(March 28, 1921)

1043 New Substation Coin Collector Circuit to Reduce Beating at Two-party Selective and Four-Party Semi-selective Stations Having Desk Stands.
(March 24, 1921)

1044 Standardization of Outside Plant Practices—Specifications No. 4131, "Use of Dynamite", Appendix 1, Blasting with Burning Fuse.
(March 28, 1921)

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1045 Preservative Treatment for Pole Butts.
(June 6, 1921)
(Replacing G. E. C. 728)

1046 Paper on Carrier Current Telephony and Telegraphy.
(April 4, 1921)
(Supplementing G. E. C. 1031)

1047 Standardization of Outside Plant Practices—Supplementing Specifications Relative to the Use of 24 Gauge Cable.
(April 9, 1921)
(Supplementing G. E. C. 778, 822, 902 and 903)

1048 Enameled Distributing Frame Wire—Change in Coil.
(April 21, 1921)
(Supplementing G. E. C. 761 and 998)

1049 No. 146 Tool for Removing Lamp Caps and Number Plates.
(April 29, 1921)

1050 No. 60-Type Designation Strip.
(April 30, 1921)

1051 No. 5 and No. 6 Type Signal Plugs.
(May 3, 1921)
(Supplementing T. C. 55)

1052 Eastern White Cedar Poles.
(May 6, 1921)

1053 Improved Heat Coil for Morse Battery Leads.
(May 9, 1921)
(Supplementing G. E. C. 854 and 898)
(Replacing G. E. C. 95)

1054 Spring Tweezers—No. 149 Tool.
(May 14, 1921)

1055 Holder for Key Sleeves Used at "A" Operators' Positions.
(May 16, 1921)

1056 Colored Lamp Caps.
(May 20, 1921)
(Supplementing G. E. C. 737)

1057 Designation Strips—Modifications in No. 8 Type.
(May 28, 1921)
(Supplementing G. E. C. 317)

1058 Cutover of Machine Switching Offices—Temporary Operators' Positions.
(June 3, 1921)
(Supplementing G. E. C. 1023)

[fol. 15397]

1059 Machine Switching Substations—Instructing Party Line Subscribers How to Make Reverting Calls.
(June 13, 1921)

1060 B Drop Wire.
(June 17, 1921)

1061 Ticket Holders for Use at Outward Toll Positions.
(June 22, 1921)

1062 Line Impedance Measuring Apparatus.
(June 21, 1921)
(Supplementing G. E. C. 941)

1063 Handbook of Central Office Telegraph Practice.
(June 20, 1921)

1064 Thimble Guy Rods.
(June 27, 1921)
(Supplementing G. E. C. 796)
(Replacing G. E. C. 961 and Specifications 3950)

1065 Peg Count Register Key—Vertical Type.
(June 28, 1921)
(Supplementing G. E. C. 808)

1066 Method of Estimating Inter-office Trunk Requirements.
(July 22, 1921)

1067 Telegraph Substations—Head Type Sounder.
July 25, 1921)

1068 Strain Plates.
(July 29, 1921)
(Replacing Specifications 3213)

1069 Substitution of Phenol Fibre for Micanite for the Bases of No. 35 and Similar Type Fuses.
(August 1, 1921)
(Supplementing G. E. C. 152 and 526)

1070 CS Ground Clamp.
(August 10, 1921)
(Replacing G. E. C. 942)

1071 Improvements in Construction of No. 20-A Test Set.
(August 12, 1921)
(Supplementing G. E. C. 608

1072 Wooden Pole Brackets.
(August 18, 1921)
(Replacing in part G. E. C. 800 and 949)
(Replacing Specifications 3972 and Amendment 1 to 3972)

[fol. 15398]

1073 Stubbing Bolts.
(August 22, 1921)

1074 Historical Data on the Development of the Telephone Art.
(August 25, 1921)

1075 Calibration of Apparatus for Measurement of Telephone Interference Factor of Voltage.
(August 20, 1921).
(Supplementing G. E. C. 900)

1076 Method of Operation of Step-by-Step Machine Switching Equipment.
(September 1, 1921)
(Replaced in Part and Supplemented by G. E. C. No. 1386)

1077 Maximum Potential on Conductors Leased to the Western Union Telegraph Company.
(August 20, 1921)
(Supplementing G. E. C. 586)
(Supplemented by G. E. C. #1215)

1078 New Apparatus Blank for Machine Switching No. 50 Type Coin Collectors.
(August 23, 1921)
(Supplementing G. E. C. 988 and Supplemented by G. E. C. 1101)

1079 Maintenance Information Governing Stromberg-Carlson Relays in Private Branch Exchange Switchboard No. 550-AC.
(Supplementing G. E. C. No. 997)
(Supplementing G. E. C. 1036)
(Transmits Supp. to Bulletin No. 16 Subject same as G. E. C.)

1080 Long Handled Shovels and Digging Spoons.
(August 30, 1921)

1081 Non-Multiple Cordless P. B. X. for Operation with Machine Switching Central Offices—No. No. 505-C.
(August 29, 1921)

1082 No. 50 Prepayment Type Coin Collector—Steel Housing Construction.
(August 26, 1921)

1083 Service Observing Equipment for Use With Machine Switching Central Offices.
(Sept. 8, 1921)
(Transmits Notes)

1084 Transmission Tests on Manual Exchange Area Circuits and Equipment. Supplements G. E. C. 634
(Sept. 7, 1921)

[fol. 15399]

1085 Amendment No. 3 to Specifications No. 3647—Reducing Couplings Supplementing Specifications No. 3647.
(Sept. 19, 1921)

1086 List of Circular Letters and Specifications. Replacing G. E. C.'s Nos. 810 and 794.
(Sept. 1, 1921)

1087 Page Printing Telegraph System Employing Type Bar Printer and Associated Apparatus.
(October 17-21)
(Transmits Bulletin #39 Subject same as G. E. C.)
(Supplemented by G. E. C. No. 1170.)

1088 Condenser Arrangement for Neutralizing Crossfire Between Open-Wire Telegraph Circuits.
(Sept. 19, 1921)
(Transmits Bulletin #33)

1089 Galvanized Pole Stops—Replacing Specifications #3295—Replacing in part G. E. C. #276.
(Oct. 11, 1921)
(Transmits Spec. 4146)

1090 "B" Guy Shield
(Oct. 3, 1921)
(Transmits Drwg. #46-M-29)
(Replaced by G. E. C. No. 1182)

1091 Construction Chains—Replacing Specifications #3111 and 4073.
(Oct. 4, 1921)
(Transmits Specs. 4148)

1092 Numbering of Line Registers.
Supplementing G. E. C. #395
(Oct. 6, 1921)

1093 Six Pair No. 6-G Connecting Block.
(Oct. 26, 1921)
(Transmits Drwg. 38-Y-1338)

1094 Inspection and Testing of the Cable Plant—Revised Cable Trouble Record Form—Supplementing G. E. C. #861.
(Oct. 24, 1921)
(Transmits Specs. 4141 and 4142 in Handbook form)

1095 No. 493-B Peg Count Register Key Replacing G. E. C. #808.
(Oct. 28, 1921)
(Transmits Drwg. 38-Y-1232)

1096 Standardization of Outside Plant Practices—Specifications No. 4157 "Cable Protection"
(Nov. 3, 1921)
(Supplemented by G. E. C. No. 1151)

1097 Improved Single and Double Pulley Cord Weights and Cord Pulley. Replaces G. E. C's 129 and 196.
(Nov. 1, 1921)

[fol. 15400]

1098 One Bolt Clamp. Replacing G. E. C. #829.
(Nov. 2, 1921)
(Transmits Spec. #4151 and Drwg. 46-L-29)

1099 Amendment No. 2 to specifications 3440 "50-50 Solder".
Supplements G. E. C.'s Nos. 222 and 780.
(Nov. 11, 1921)
(Transmits Amend. #2 Spec. 3440)

1100 Tinned Copper Sleeve for Cable Conductors.
Supplementing G. E. C. No. 702.
Replacing Spec. No. 3817.
(Dec. 9, 1921)

1101 Machine Switching Substations. Transmitting Specifications No. 4160. Supplementing G. E. C. No. 988 and 1078.
(Dec. 19, 1921)
(Supplemented by G. E. C. #1312)

1102 Improved Open Space Cutout for the Main Distributing Frame Protector which Mounts on 3/8" Centers.
Supplementing G. E. C. No. 917.
(Jan. 5, 1922)

1103 Sleet Storm Map.
(Jan. 4, 1922)
(Transmits Map of U. S. Showing Sleet Storm Areas)

1104 3-A Transmission Measuring Set.
(Jan. 12, 1922)
(Transmits Bulletin #35 subject as above)

1105 Short Lengths of Inside Wire. Replacing G. E. C. No. 842.
(Transmits Amendment #2 to Spec. #3805)
(Jan. 10, 1922)

1106 Braces for F. X. Terminals. Supplementing G. E. C. No. 991.
(Transmits Issue 2—Drwg. No. 46-L-51)
(Jan. 9, 1922)

1107 Improvements in Operator's Set.
(Jan. 6, 1922)

1108 Paraffin Pots.
(Jan. 17, 1922)
(Transmits Drwg. 46-M-66 and 46-M-68)

1109 No. 4 and No. 6 Bridging Connectors.
(Jan. 23, 1922)
(Transmits Drwg. 46-L-97 = No. 6 connector, Drwg. 46-L-98 = No. 4 connector)

1110 Substation Soldering Copper Heater.
(Jan. 24, 1922)
(Transmits Drwg. 38-Y-1331 Heater, Drwg. 38-Y-1330—Alcohol (fuel) container and Drwg. 38-Y-1385—Substation Soldering Copper)

1111 Fuse Wrench (#216 Tool) January 24, 1922.
(Transmits Drwg. 95-E-69)

[fol. 15401]

1112 Washers. Replacing Spec. No. 3078. Replacing in part G. E. C. No. 276.
(Feb. 14, 1922)
(Transmits Spec. 4149)
(Supplemented by G. E. C. #1367)

1113 Standardization of Outside Plant Practices. Specifications 4032. Underground Cable Placing. Supplement A.
(Feb. 2, 1922)
(Transmits Handbook Spec. 4032—Supp. A)

1114 4-A Transmission Measuring Set.
(Feb. 24-22)
(Transmits Sect. 1-B of Part II—Subject Description of 4-A Transmission Measuring Set)

1115 D. P. Insulator. Supplementing G. E. C. #1009.
(Feb. 15, 1922)
(Transmits Issue 3 Drwg. #46-L-20)

1116 Underground Construction. Forms for Concrete Manholes.
(Feb. 28-22)
(Transmits, "Notes: Construction of Concrete Manholes" also drwgs. 142-A-47, 48, 55, 143-A-1, 2, 3 and 194-B-53, 54 and Appendix "Analysis of Cost of Brick and Concrete Manholes")

1117 Method of Assigning Lines and Trunks. Panel Machine Switching Equipment.
(Feb. 20-1922)

1118 Six-pair Metal Building Terminal Box. Supplementing G. E. C. 1093.
(Feb. 21-1922)
(Transmits Drwg. 188-B-76)

1119 Abandonment of Practice of Providing No. 10 B. & S. Gauge Conductors in Toll Entrance Cables.
(Mar. 16-1922)
Superseding in part G. E. C. No. 253.

1120 Wooden Apparatus Blanks.
(Feb. 22-1922)
(Transmits Drwg. 38-Y-1177)

1121 Half Round Wooden Moulding.
(Mar. 4-1922)
(Transmits Drwg. 90-E-8)
(Replaced by G. E. C. #1296)

1122 Cable Clamps. Supplementing G. E. C. #931.
(Mar. 6-1922)
(Transmits Drwg. 46-L-114)

1123 One Sheave Cable Block.
(Mar. 6-1922)
(Transmits Drwg. 140-A-73)

1124 Rosin Core Solder. Supplementing G. E. C. Nos. 222 and 780.
(Mar. 7-1922)
[fol. 15402] (Transmits Spec. No. 4152)

1125 Standardization of Long Cords for Use at Substations.
(Mar. 23-22)
(Supplemented by G. E. C. 1258)

1126 Standardization of Porcelain Type Open Space Cutout and Nos. 83-A and 84-A Protector Mountings.
(Mar. 28-22)
Replacing G. E. C. Nos. 185 and 452.
(Transmits Bulletin #45 Porcelain Type Open Space Cutouts for Cable Protection and Bulletin #47 Protector Mountings No. 83-A and 84-A)
(Supplemented by G. E. C. No. 1157)

1127 Specifications No. 4063 for 455—Pair 19-Gauge Cable.
(Mar. 24-22)
(Transmits Specifications #4063 as Per Above)

1128 Machine Switching Substations—Transmitting Specifications Covering Maintenance of Automatic Electric Company Dials at Substations.
(Mar. 27-22)
(Transmits Handbook Spec. 4159 Subject As Above)

1129 Improved Window Frame for No. 10-A Message Register.
(Mar. 29-22)
Supplementing G. E. C. No. 594.

1130 Stencil Paints.
(Mar. 31-22)
(Transmits Specs. #4167, Black Paint and 4168, Orange Paint)

1131 Relay Contact Burnisher—No. 265 Tool.
(Apr. 3-22)
(Note: No. 266 Tool Also Included Which Is a Repair Part, Blade only)

1132 Tinned Steel Sleeves—Amendment No. 1 to Specifications No. 4137.
(Mar. 30-22)
Supplementing G. E. C. No. 1027.
(Transmits Amendment #1 to Spec. 4137)
(Supp. by G. E. C. 1382)

1133 Eastern White Cedar Poles.
(Mar. 29-22)
(Replaced G. E. C. 1052)
(Transmits Amendment #2 to Spec. 3254)

1134 Standardization of Outside Plant Practices—Specification No. 3928 "Open Wire Construction". Supplementing G. E. C. No. 431 and 674.
(Mar. 30-22)
(Transmits Handbook Spec. #3928 Subject As Above)

1135 3-A Oscillator.
(Apr. 6-22)

1136 Specifications for Chestnut Poles.
Replacing G. E. C. No. 1022.
(Apr. 7-22)
(Transmits Spec. #4166, Subject As Above, Which Replaces Spec. #4138)
(Supplemented by G. E. C. #1379)

1137 No. 50-A Repeating Coil.
(Apri. 4-22)
Replaces in Part G. E. C. #54 and Supplements G E. C.'s Nos. 462 and 523.
[fol. 15403] (Supplemented by G. E. C. #1178)

1138 Improvement in Design of Splicers' Contact Points.
(Apr. 17-22)
Replacing G. E. C. No. 738.
Replacing Drawing #4-E-13.
Replacing Drawing #179-B-64.
(Transmits Drawing 46-L-95 Splicers Test Point and Drawing 46-L-106 Needle Point Test Pick)

1139 Improved Cross-Connecting Ring for "B" Cable Terminal.
Supplementing G. E. C. No. 934.
(Apr. 19-22)
(Transmits Drawing 46-B-52)

1140 Snatch Block.
(Apr. 29-22)
(Transmits Illustration of Block)

1141 7-A and 7-B Oscillators.
Replaces in part G. E. C. No. 473.
(Apr. 25-22)
(Transmits Bulletin #30)

1142 Telephone Attachments at Substations.
Supplementing G. E. C. No. 66.
(Apr. 14-22)

1143 Substation Transmitter for use on Long Loops.
(Apr. 12-22)

1144 High Impedance Ringer to reduce inductive noise on two-party selective and four-party semi-selective lines.
(Apr. 24-22)

1145 Public Telephone Stations—Open Type Telephone Booths.
(Apr. 14-22)
(Transmits Drwg. 144-A-21 and 144-A-22 Provisional Drwgs.)

1146 Form for Record of Explosives.
Supplementing G. E. C. 1021.
(Apr. 21-22)
(Transmits Copy of Form E-260)

1147 Pheonal-Fibre Tops for Horizontal Type Keys with Indicators.
(Apr. 26-22)

1148 Telephone Attachments at Substations.
Supplementing G. E. C. No. 1142.
(May 5-22)
(Transmits Photograph)

1149 No. 50 Coin Collector Maintenance—Transmitting Handbook Specifications 3858.
(May 4-22)
(Transmits Handbook Spec. #3858 and Form E-158 Out of Order Card)

1150 Cabinets for Storage of Operators' Telephone Sets.
(Transmits Drwg. 143-A-57)
(May 15-22)

1151 Standardization of Outside Plant Practices—Transmitting Supplement A to Specifications No. 4157. "Cable Protection".
Supplementing G. E. C. No. 1096.
[fol. 15404] (May 9-22)

1152 Strength of Old Eastern White Cedar Poles.
May 24-22.
(Transmits Bulletin #49)

1153 Toll and Exchange Glass Insulators.
(May 17-22)
Supplementing G. E. C. 1009.
(Transmits Issue 3 of Drawings 46-L-19 and 46-L-52)

1154 Earth Boring Machines.
Supplementing G. E. C. #950.
(May 16-22)

1155 Sub-station Number Plates.
(May 22-22)
(Supplementing G. E. C. No. 369)

1156 M. D. F. Test Plug No. 206.
(May 26-22)
(Note: No. 716 and 733 cords also mentioned)

1157 Improvements in No. 8 Terminals.
(May 27-22)

1158 Porcelain Strain Insulators.
(May 31-22)
Supplementing G. E. C. #962.
(Transmits Amend. #1 to Spec. 4041)
(Replaced by G. E. C. No. 1316)

1159 Switchboard Cords—Abandonment of Waxing.
Replacing G. E. C. No. 864.
(May 25-22)

1160 No. 2-A Repeater Gain Set—Bulletin No. 27.
(June 2-22)
(Transmits Bulletin No. 27)

1161 Manhole Cover Hook.
(June 6-22)
(Transmits Drwg. 46-M-87)

1162 Standardization of Outside Plant Practices—Specifications 4171 "Underground Conduit for Service Connections".
(June 1-22)
(Transmits Handbook Spec. 4171)

1163 Cable Splicing Operations in Machine Switching Areas.
Supplementing G. E. C. No. 778 and Spec. No. 3912.
(June 9-22)
(Transmits Supp. E to Spec. 3912 to handbook form)

1164 1-A Composite Set Bridge.
(June 21-22)
(Transmits Bulletin No. 32—Same Subject)

1165 5-A Carrying Case.
(June 21-22)
(Transmits Drwg. 904-632)

[fol. 15405]

1166 Key West—Havana Cables.
(June 12-22)
(Transmits Paper on above cable)

1167 Auxiliary Receivers for Use at Substation.
(June 19-22)

1168 Improved Phantom Repeating Coils.
(June 16-22)
Replacing in Part G. E. C. 371—Supplementing G. E. C. 826.
(Transmits Bulletin #53 Subject Same as G. E. C.)
(Replaced by G. E. C. #1339)

1169 Routine for the Inspection of Operators' Telephone Sets.
(Transmits Sect. IV-B of Transmission Practices)
(June 24-22)

1170 Maintenance of Printing Telegraph Apparatus.
(July 5-22)
Supplementing G. E. C. #1087.
(Transmits "Bulletin No. 50—Maintenance Information Regarding Printing Telegraph Sets Employing Type Bar or Type Wheel Printers)
"Notes on Printing Telegraph Maintenance Practices" dated March 30-1922.
"Notes on Training of Printer Maintenance Men" dated March 30-1922.
(Supplemented by G. E. C.'s No. 1262 and 1387)

1171 Machine Switching Sub-stations—New Dial Cord for Desk Stands.
(June 26-22)
Supplements G. E. C. No. 988.

1172 Metal Subscribers' Sets—Change in Construction of Base.
(June 28-1922)
Supplements G. E. C. 593 in part.
(Transmits photograph of old and new type sets)

1173 Standardization, of Sub-station Practices—Specifications No. 4170 Sub-station and Private Branch Exchange. Protector Installation.
(Transmits Handbook Spec. #4170)
(June 27-22)
(Supplemented by G. E. C. No. 1251)

1174 Small Gauge Non-Quadded Cables Manufactured with Staggered Pair Twist.
(June 29-22)
(Supplemented by G. E. C.'s Nos. 1266, 1284 and 1346)

1175 Machine Switching—Maintenance of Dials at Sub-stations and Central Offices.
(July 6-22)
Supplements G. E. C. No. 988.
(Transmits Instructions covering "Maintenance of Western Electric Company No. 2 Type Dials Used at Central Offices, and Large Private Branch Exchanges)
(Supplemented by G. E. C. 1260)

[fol. 15406]
1176 Public Telephone Stations: Booth Lamp Guard.
"Transmits Drwg. 143-A-56".
(July 1-22)

1177 Power Pumps.
(July 17-22)
(Transmits Specifications #4178 (Handbook form) "Operation of Power Diaphragm Pump")

1178 Price of No. 50-A Repeating Coil.
(June 30-22)
Supplements G. E. C. No. 1137.

1179 Unit Type Magneto Switchboard No. 1800
(Aug. 31-22)
Supplements G. E. C. No. 263.
" " " 385.
(Transmits Bulletin No. 56 Subject same as G. E. C.)

1180 Method of Assigning Lines and Trunks—100 Point Step-by-Step Machine Switching Equipment.
(July 14-22)
(Transmits Notes: Same Subject)

1181 5/8 Inch Forged Eye Nuts.
July 18-22.
Replacing in part G. E. C. No. 953.
(Transmits Issue 2 of Drwg. 46-L-26)

1182 B Guy Shelf.
(July 19-22)
Replacing G. E. C. 1090.
(Transmits Issue 3 of Drwg. 46-M-29)

1183 Tamping Bar.
(July 17-22)
(Transmits Specifications 4156 Tamping Bar, Drwg. 46-L-1)

1184 "R" and "S" Cable Balconies.
(July 19-22)
Supplementing G. E. C. No. 944.
(Transmits Drwgs. 143-A-4 ("R" Balcony) and 143-A-5 ("S" Balcony).

1185 Green Pole Paint.
(July 18-22)
(Transmits Specifications No. 4175 (Replacing Spec. 2642)).

1186 Protection for Exposed Cord Tips at Private Branch Exchanges.
(July 24-22)
Supplementing G. E. C. No. 550.

1187 1-A Transmission Measuring Set, 2-A Oscillator, and Detailed Methods for Making Transmission Tests on Manual Circuits and Equipment.
Replacing in Part G. E. C. No. 634.
(Aug. 1-22)
(Transmits Sections I-A, I-C, II-A of Part I of Transmission Mtce. Practices.
(Transmits also Transmission Mtce. Practices—List of Current Sections dated July 13-22)

[fol. 15407]

1188 Method of Operation of Panel Machine Switching Equipment.
(Transmits Bulletin: Same subject)
(Aug. 15-22)

1189 Standardization of Outside Plant Practices—Specifications 3912 General Cable Splicing. Supplement, D.
(July 28-22)
Supplementing G. E. C. No. 778.
Supplementing Specifications 3912.
(Transmits Supplement D to Handbook Spec. #3912)

1190 Machine Switching—Operators' Dialing Tools.
(July 31-22)

1191 Sale of Testing Apparatus to Power Companies and Other Outside Associated Interests.
(July 25-22)

1192 Trouble Operators' Positions for Switchboards Nos. 1, 1-C and 1-D.
Replacing in Part G. E. C. Nos. 522 and 766.
Supplementing G. E. C.'s 644 and 787.
(Transmits Bulletin No. 62 Subject same as G. E. C.)
(Aug. 15-22)

1193 Toll Operating Room Desks.
(Oct. 16-22)
(Transmits Bulletin No. 66. Same subject. Also Notes on Toll Operating Room Desks).

1194 No. 6-A Distributor Used as a Rotary Telegraph Interrupter.
(Transmits Bulletin No. 51: Same Subject)
(Aug. 17-22)
(Supp. G. E. C. #1387)

1195 Public Address Systems.
(Aug. 17-22)
(Transmits Bulletin No. 61: Same Subject)
(Supplemented by G. E. C. No. 1328)

1196 Sub-station Installation—Inside Wiring Nail.
(Supplementing G. E. C. No. 987)
(Aug. 31-22)

1197 Lanterns.
(Aug. 29-22)
(Transmits Drwg. 46-M-58)

1198 Drive Screws.
(Aug. 30-22)
Replacing in Part G. E. C. 276.
Replacing G. E. C. 698.
(Transmits Specifications No. 4048)

1199 Standardization of Outside Plant Practices—Specification No. 3926—Pole Line Construction.
(Aug. 28-22)
Replacing G. E. C. No. 674.
(Transmits Spec. No. 3926 Same Subject as above)

1200 "Standard Traffic Engineering Practices for Local and Toll Central Office Equipments".
(Nov. 14-22)
Replacing G. E. C.'s No. 644 and 886.
[fol. 15408] (G. E. C. is in Bulletin Form)

1201 Braces for Extension Fixture and Terminal Pole Crossarms.
(Aug. 31-22)
Replacing G. E. C. 769.
Replacing in part G. E. C. 276.
(Transmits Spec. 4182 Same Subject)

1202 Pole Derrick Jacks.
(Sept. 22-22)

1203 Friction Tape.
(Aug. 31-22)
Replacing G. E. C. 804.
Replacing G. E. C. 725.
Replacing Specifications 3886.
(Transmits Spec. 4183 "Friction Tape")

1204 Pole Derricks.
(Sept. 30-22)
(Transmits Handbook Specification 4192—Operation of Pole Derricks Drawing Nos. 141-A-70 to 73 inc. 143-A-27 to 34 inc. and 195-B-31 also 2 cuts.)

1205 Truck Bodies.
(Sept. 11-22)
(Transmits drwgs. and pictures)

1206 Specifications 4123 "NM" Cable.
(Sept. 12-22)
(Supplementing G. E. C. No. 996)
(Transmits Spec. 4123)

1207 Nos. 7, 8 and 9 Fanning Strips.
(Sept. 13-22)

1208 Amendment No. 1 to Specifications No. 4127—"Muslin".
(Sept. 19-22)
Supplementing G. E. C. 1038.
(Transmits Amendment as shown above).

1209 Mechanical Toll Ticket Distributing System.
(Oct. 5-22)
Supplementing G. E. C. 1042.

1210 Standardization of Sub-station Practices—Specifications No. 3859 Substation Wiring Plans.
(Sept. 20-22)
(Transmits Handbook Spec. No. 3859 subject as above, also Forms E-404 to E-415 together with illustrations of sub-sets)

1211 S Tree Wire.
(Sept. 30-22)
(Transmits Spec. 4153 S Tree Wire)

1212 Cable Clamps and Cable Clamp Rings.
(Sept. 27-22)
Replacing G. E. C.'s Nos. 931 and 958.
(Transmits Spec. No. 4191 Subject same as G. E. C.)

1213 C Cable Extension Arm.
(Sept. 30-22)
Replacing in Part G. E. C. No. 960.
(Transmits Drwg. 46-M-5 Issue 3)

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1214 Storage Battery System for Supplying Coin Collect Current.
(Oct. 12-22)
(Transmits Bulletin No. 55 Subject, same as above)

1215 Maximum Potential on Conductors Leased to Western Union Telegraph Company.
(Oct. 6-22)
Supplementing G. E. C.'s 486 and 1077.

1216 Sub-station Materials—Tools and Gauges—Battery Light.
(Oct. 10-22)
(Transmits Bulletin No. 67—Battery Light)

1217 Sub-stations—Desk Stands—New Felt for Base.
(Oct. 9-22)

1218 Telegraph Sounder Stopper No. 12087.
(Oct. 11-22)

1219 Telephone Buildings—Dust Screens for Windows in Machine Switchrooms.
(Oct. 19-22)

1220 Neutralization of Crossfire in Cable Circuits.
(Nov. 15-22)
(Transmits Bulletin No. 64 Arrangements for Neutralizing Crossfire Between Grounded Polar Duplex Telegraph Circuits in Cable)

1221 Stop Accidents Insigne and Year Plates.
(Oct. 29-22)
(Transmits Notes, same subject, in both 8½" x 11" and Handbook Sizes)

1222 Outside Plant Engineering Practices.
(Nov. 1-22)
(Transmits Preliminary Draft of General, Pole Line and Underground Conduit Handbooks and of the Specifications for Pole Line Inspection)

1223 Pulling-Up Clamp.
(Nov. 14-22)
Replacing G. E. C. No. 983.
(Transmits Drwg. 136-A-85 Issue 2 Pulling-Up Clamp)

1224 Standardization of Outside Plant Practices—Supplementary Specifications Relative to the Use of 455-Pair 19-Gauge Cable.
(Nov. 9-1922)
Supplementing G. E. C.'s Nos. 778 and 902.
(Transmits Supp. "B" to Spec. 3929 Aerial Cable Const., and Supp. "F" to Spec. 3912 General Cable Splicing)

1225 Strand Puller.
(Nov. 24-22)
(Transmits Drwg. 141-A-75 "B" Puller and Drwg. 141-A-78 "C" Puller)

1226 Digging Bar.
(Nov. 16-22)
(Transmits Spec. 4204 which replaces, Spec. 3140)
(Transmits Drwg. 46-L-136 which forms part of Spec. 3140)

[fol. 15410]

1227 Wooden Cable Dresser.
(Nov. 23-22)
(Transmits Drwg. 46-L-113)

1228 Blasting Mat.
(Nov. 25-22)
(Transmits Drwg. 46-Z-2, Blasting Mat)

1229 Wiping Cloth and Crotch Cloths.
(Nov. 29-22)
(Transmits Drwg. 46-M-121 "Wiping Cloths")
(Transmits Drwg. 46-L-122 "Crotch Cloths")

1230 Splicers Mirror.
(Dec. 2-22)
(Transmits Drwg. 46-L-142)

1231 Houseline.
(Dec. 1-22)
Replaces G. E. C. 964.
Replaces Specifications No. 4069.
(Transmits Specifications 4184)

1232 Multiple Private Branch Exchange for Operation with Manual and Machine Switching Central Offices—No. 600-C.
(Jan. 23-23)
(Transmits "Bulletin No. 29A" and "Notes giving Method of Operation")

1233 4-B Oscillator.
(Jan. 10-23)
Supplementing G. E. C. No. 941.
(Transmits Bulletin No. 70- 4-B Oscillator)

1234 Calculagraphs—Automatic Ribbon Reverse and Improved Winding Tool.
(Dec. 6-22)
(Transmits Drwg. 38-Y-1463 covering Winding Tool and Key Pipe)

1235 Handbook of Substation Practices—Transmitting Supplement "A" to Specifications No. 3853, Substation Wiring.
(Dec. 19-22)
(Supplementing G. E. C. No. 712)
(Transmits Handbook Spec. as above)

1237 Telephone Repeaters—Nos. 101-D and 102-D Vacuum Tubes.
(Jan. 13-23)
Supplementing G. E. C. No. 714 and G. E. C. No. 883.
(Transmits Bulletin No. 68—Nos. 101-D and 102-D Vacuum Tubes in Telephone Repeaters)

1238 Bower Barff Finished Hand Wheels for Power Switchboards.
(Dec. 26-22)

1239 New "A" and "B" Operators' Telephone Sets.
(Jan. 6-23)
(Transmits Bulletin No. 58—"No. 62 Induction Coil "B" Operators Telephone Set also Bulletin No. 71—"No. 63 Induction Coil "A" Operators' Telephone Set)

1240 Guy Clamp.
(Dec. 28-22)
Replacing in part G. E. C.'s Nos. 276, 516 and 681.
(Transmits Spec. 4180 which includes
[fol. 15411] Drwg. 46-L-60)

1241 Ground Wire.
(Jan. 3rd, '23)
Supplementing G. E. C. No. 622.

1242 3/8 Inch Woven Conduit.
(Jan. 15-23)
Replacing in Part G. E. C. No. 881.

1243 Cardboard Containers for First Aid Materials.
(Jan. 18-23)
Supplementing G. E. C. No. 956.
(Replaced in part and supplemented by G. E. C. No. 1363)

1244 Solder Pot.
(Jan. 15-23)
(Transmits Drwg. 46-M-73)

1245 House Bracket.
(Feb. 6-23)
(Transmits Amendment No. 1 to Spec. No. 3316 also Drwg. 46-L-184 which replaces 88-E-88)

1246 Paraffin Dipper.
(Jan. 16-23)
(Transmits Drwg. 46-M-70)

1247 Handbook of Central Office Telegraph Practice.
(Feb. 28-23)
Supplementing G. E. C. No. 1063.
(Transmits Specifications No. 4064 "Arrangements for Obtaining Simultaneous Telephone and Grounded Circuit Telegraph Operation" also Specifications No. 4065—"Telegraph Circuits at No. 4 Morse Board and Test Board" also Form E-268—Revised Dec. 22, 1922—"List of Specifications Included in Handbook of Central Office Telegraph Practices").

1248 Standardization of Outside Plant Practices—Supplementary Specifications Relative to the Use of New Type Guy Clamp.
(Jan. 22-23)
Supplementing G. E. C.'s Nos. 822, 902, 903 and 1010.
(Transmits Supp. "A" Spec. 3927 "Guying", Supp. "C" Spec. 3929 "Aerial Cable Construction", Supp. "B" Spec. 3931 "Block Cable Construction", Supp. "B" Spec. 3933 "House Cable Placing")

1249 Wooden Insulator Pins.
(Jan. 22-23)
Replacing in part G. E. C. No. 613.
Replacing G. E. C. No. 809.
(Transmits Spec. No. 4213 with Drwgs. Nos. 46-L-90 and 46-L-91)

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1250 Creosoted Yellow Pine Poles.
(Jan. 23-23)
Replacing G. E. C. No. 721
(Transmits, Specifications No. 4209 (Subject same as G. E. C.))

1251 Sub-stations Protection No. 60-A Fuse.
(Jan. 24-23)
Supplementing G. E. C. No. 1173
(Transmits Bulletin No. 73 "Sneak Current Fuse For Private Branch Exchanges and Telegraph Substations.")

1252 Power Plant and Main Distributing Frame Grounding System.
(Jan. 20-23)
(Transmits Bulletin No. 63. "Power Plant and Main Distributing Frame Grounding System)

1253 Iron Cable Dresser.
(Jan. 29-23)
(Transmits Drwg. 46-L-107, Same Subject)

1254 Inadequate Separations on Jointly Used Poles and at Crossings of Telephone Wires over Foreign Wires.
(Jan. 30-43)
(Supplementing G. E. C. No. 975

1255 Telegraph Substation Installation—Supplement "A".
(Jan. 29-23)
(Supplements G. E. C. No. 823
(Transmits Supp. "A" to Spec. 3852 Subject as above)

1256 Simplex Pole Jack.
(Feb. 17-23)
(Transmits Bulletin No. 14—The Simplex Pole Jack)

1257 No. 30 Protector Block.
(Jan. 30-23)
Supplementing G. E. C. No. 1126

1258 Long Cords for Use at Substations.
(Feb. 3-23)
Supplementing G. E. C. No. 1125

1259 Public Telephone Stations—Booth Lamp Receptacle.
(Transmits Drwg. 705-681)

1260 Quickly Detachable Dial Mounting for Central Office Switchboards, Attended Pay Stations and P. B. X. Switchboards.
(Apr. 16-23)
Supplementing G. E. C. 1175
(Transmits Photographs and Maintenance Information)

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1261 Transposition Practices, Exclusive of Construction.
(Mar. 15-23)
Replacing G. E. C. No. 825
Replacing in part G. E. C. No. 738
Supplementing and in part replacing G. E. C.'s Nos. 563 and 652
Supplementing G. E. C. No. 871
(Transmits Number of sections—Subject Transposition Practices)

1262 Maintenance of Printing Telegraph Apparatus —Spring Balances.
(Feb. 26-23)
Supplementing G. E. C. No. 1170

1263 Use of Shellac on Cable Forms.
(May 11-23)
Replacing G. E. C. No. 667

1264 Substations—Repair of No. 2 Type Dials.
(Mar. 1-23)
Supplementing G. E. C. 296 and G. E. C. 554.

1265 Standardization of Outside Plant Practices. Specifications 4190 Railroad Crossings.
(Mar. 19-23)
Replacing G. E. C. No. 401 and G. E. C. No. 530
(Transmits Specification No. 4190 Handbook Form)

1266 Distinctive Markings for Staggered Twist Construction in Small Gauge Non-Quadded Cables and for Experimental Cables.
(Mar. 5-23)
Supplementing G. E. C. 1174

1267 135-Cycle Signaling Motor—Generator Sets.
(Mar. 16-23)
(Transmits Bulletin No. 69 Subject as above)

1268 Modification of No. 2 Private Branch Exchange System for Machine Switching Operation.
(Mar. 27-23)
(Transmits drawing 143-A-41 Private Branch Exch. No. 2 and Dwg. 708-5 Modifications in No. 2 P. B. X. Subscribers Sets)

1269 Cable Bending Spring.
(Mar. 26-23)
(Transmits Dwg. 46-X-14. Subject same as G. E. C.)

1270 No. 217 Plug for Use in Repeater Gain and Balance Tests and Line Impedance Tests.
(Mar. 27-23)
Supplementing G. E. C.'s No. 714, 891, 941, and 1029
(Transmits Dwg. 38-Y-1468 No. 217 Resistance Plug)

1271 Bolts for Cable Suspension Clamps.
(April 5-23)
Replacing G. E. C. No. 179
Replacing in part G. E. C. 276
(Transmits Specifications 4197—Dwg. 46-L-137)

1272 Substations—Materials—Tools and Gauges—No. 311 Tool.
(Mar. 26-23)
(Transmits Dwg. 38-Y-1619 No. 311 Tool)

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1273 Crossarm Bolts.
(Mar. 28-23)
Replacing in Part G. E. C. #276
Replacing in Part G. E. C. No. 698
(Transmits Specifications 4174)

1274 Cant Hook—Specifications No. 4205.
(Apr. 17-23)
(Transmits Specifications 4205—Dwg. 46-L-82)

1275 Strand Connectors.
(Apr. 3-23)
Supplementing G. E. C. 760
(Transmits Amendment No. 1 to Specifications 3925)

1276 Tool for Removing Signal Plugs No. 274 Tool.
(Apr. 10-23)
(Transmits Dwg. 38-Y-1641)

1277 Toll Transmission Practices—Section IX-A Vacuum Tubes Used in the Bell System—Bulletin No. 77.
(Oct. 19-23)
(Transmits Bulletin No. 77—Toll Transmission Practices)

1278 Telephone Repeater Data—Section II-E Arrangement for Connecting Cord Circuit Repeaters to Circuits Terminated with Three-Winding Transformers—Bulletin No. 74.
(Supplementing G. E. C. No. 826)
(June 23-23)
(Transmits Bulletin No. 74—Improved Method for Connecting Cord Circuit Repeater to Four-Wire Circuit)

1279 Transmission Maintenance Practices—Section VIII-E—Routine for Toll Circuit Layout. Records.
(July 3, 1923)
(Transmits Bulletin—Same subject as G. E. C.)

1280 Manhole Platform Support.
(Apr. 12-23)
(Transmits Dwg. 46-M-71 Subject as above)

1281 Type "T" Medium Speed Vertical Engines for Driving Commercial Type Emergency Generating Equipment in Machine Switching Offices
(May 25-23)
(Transmits Bulletin No. 83—Type "T" Vertical Engines for Telephone Reserve Power Service)

1282 Power Plants for Panel Machine Switching Offices.
(May 1-23)
(Transmits Bulletin No. 85 "(Replacing Bulletin No. 41)"
(Power Plants for Machine Switching Offices of the Panel Type)
(Supp. by G. E. C. #1336)

1283 Standard Combination Reel.
(May 1-23)
(Transmits Amendment No. 1 to Spec. 2251)

1284 Specifications 4124—"ANA" Cable.
(Apr. 28-23)
Supplementing G. E. C. No. 1174
Replacing G. E. C. 852
Replacing G. E. C. 635
Replacing Spec. 3800
(Transmits Specifications 4124—"ANA" Cable)

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1285 Specifications No. 4125—"ANB" Cable.
(May 3-23)
Replacing G. E. C. No. 388
Replacing Spec. 3357
(Transmits Specifications 4125 "ANB" Cable)

1286 Trolley Guards and "D" Tree Guards.
(May 3-23)
(Replacing in part G. E. C. #911)
(Transmits Dwg. 46-M-12 Issue 3 Douglas Fir Trolley Guard
(Transmits Dwg. 46-M-13 Issue 3 Southern Yellow Pine Trolley Guard
(Transmits Dwg. 46-M-76 Douglas Fir "D" Tree Guard
(Transmits Dwg. 46-M-78 Southern Yellow Pine "D" Tree Guard)

1287 Waxed Linen Thread.
(Apr. 26-23)

1288 Rubber Bandages and Bag for Rubber Bandages.
(May 7-23)
(Transmits Dwg. 46-x-10 Rubber Bandage.
(Transmits Dwg. 46-x-6 Bag for Rubber Bandage

1289 Splicers' Tents.
(May 5-23)
Replacing G. E. C. No. 969
Replacing Drawing No. 138-A-12
(Transmits Drawing 141-A-90)

1290 Pike Poles.
(May 11-23)
(Transmits Spec. No. 4235 Pike Poles, and Dwg. 46-M-35)

1291 Manila Rope.
(May 4-23)
(Supplementing G. E. C. No. 466)
(Transmits Specs. No. 4218—Replacing Specs. 3682)

1292 Substations—Signs—Sign Cement Kit.
(May 11-23)
(Supplementing G. E. C. No. 862)
(Transmits Dwg. 46-L-175 which replaces Dwg. 94-E-34)

1293 Toll Switchboard No. 1—Flush Type Glass Keyshelf Bulletin Holder.
(May 12-23)
(Transmits Dwg. 704-1661 Same subject as G. E. C.)

1294 Improvements in Existing Types of Composite Ringer Equipment.
(May 25-23)
Replacing G. E. C.'s 428 and 850
Partly Replacing G. E. C. 898
Replacing Specs. 3252
(Transmits Bulletin No. 87 (Subject same as G. E. C.) which replaces Bulletin No. 31)
(Supp. by G. E. C. 1384)

1295 Round Washers.
(May 16-23)
(Supplementing G. E. C. No. 1112)
(Transmits Issue 2 of Dwg. 46-L-87)

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1296 Half Round Wooden Molding.
(May 22-23)
(Replacing G. E. C. 1121)
(Transmits Dwg. 46-L-200 Subject same as G. E. C.)

1297 Creosoted Plank for Two Block Anchors.
(May 15-23)
(Transmits Amendment No. 1 to Specifications No. 3138 and Dwg. 46-L-222)

1298 Substations—Tools and Gauges—Transmitter Carrying Bag.
(May 14-23)
(Transmits Dwg. 38-Y-1606—Transmitter Carrying Bag)

1299 Type "A" Porcelain Knob.
(May 24-23)
(Transmits Issue 4 of Dwg. 89-E-5 Type "A" Porcelain Knob)

1300 Substations—No. 152-A Backboard for Loud Ringing Bells.
(May 22-23)
(Transmits Dwg. 705-509. Subject same as G. E. C.)

1301 Rubber Gloves.
(May 28-23)
(Transmits Specifications No. 4238—Provisional Specifications for Rubber Gloves).

1302 Machine Switching Private Branch Exchange No. 700-C for Use in Manual or Machine Switching Central Office Districts.
(Sept. 25-23)

1303 Cable Car and Sliding Hook.
(June 9-23)
Transmits Specifications #4217—Cable Car Dwg. 143-A-7 and Drawing 46-M-75 Sliding Hook

1304 Insect Injury to Cable Sheath.
June 13-23
(Transmits Bulletin No. 78—Same Subject)

1305 Standardization of Outside Plant Practices—Specifications No. 4236 "Terminal Marking".
(May 23-23)
(Transmits Handbook—Specs. 4236 "Terminal Marking")

1306 Specifications for Creosoting Douglas Fir Timber and Specifications for Creosoted Douglas Fir Conduit.
(June 12-23)
(Replacing Specifications No. 3115)
(Transmits Spec. No. 4242—Replacing Spec. 3115—Specs. for Creosoting Douglas Fir Timber. Transmits Spec. No. 4243—Specs. for Creosoted Douglas Fir Conduit)

1307 Termination of Railroad Dispatch and Message Circuits in P. B. X. Switchboards.
(May 29-23)

1308 Splicer's Fiber Test Board.
(May 26-23)
(Transmits Dwg. 46-L-177, Subject same as G. E. C.)

1309 Standardization of Outside Plant Practices—Specifications No. 4246 "Maintenance of No. 14 Cable Terminals".
(June 13-23)
(Transmits Specs. as above)

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1310 Goggles.
(June 26-23)
(Transmits Bulletin No. 76—Goggles)

1311 Substations - Standardization of Practice—Transmitting Supplement "A". To specifications No. 3857—No. 50 Coin Collector Installation.
(June 29-23)
Supplementing G. E. C. No. 712
(Transmits Supp. "A" to Specs. 3857—Handbook form)

1312 Machine Switching Substations—Transmitting Supplement "A" to Specifications No. 4160.
(June 16-23)
Supplementing G. E. C.'s No. 988 & 1101.
Transmits Supp. "A" to Spec. No. 4160 Machine Switching Substations. Handbook form.

1313 Substation—Coin Collectors—Carrying Case for Coin Relays and container for Coin Shutes.
(June 14-23)
Supplementing G. E. C. No. 1149
(Transmits Dwg. 38-Y-1467 — Carrying Case for Coin Relay)

1314 Renumbering Strips.
(June 18-23)
(Transmits Dwg. 46-M-143)

1315 Corner Bridle Rings.
(June 15-23)
(Replacing G. E. C. No. 161)
(Transmits Spec. No. 4244 "Dwg. 46-L-183" Same subject, which replaces Spec. No. 3328)

1316 Porcelain Strain Insulators.
(June 22-23)
Supplementing G. E. C. No. 962
Replacing G. E. C. No. 1158
(Transmits Amendment No. 2 to Spec. No. 4041 also Dwg. 46-L-134)

1317 Pot Hook.
(June 1923)
(Transmits Dwg. 46-L-185)

1318 1 Inch Cotton Tape.
(June 20-23)

1319 Shave Hook.
(June 27-23)
(Transmits Dwg. 46-L-128 Issue 2—Shave Hook)

1320 Loading Data—Section II-A Stub Cables for Loading Coil Cases Bulletin No. 88.
(Dec. 8-23)
(Transmits Bulletin No. 88—Subject same as G. E. C.)

1321 Loading Data—Section II-C—Loading Coils and Cases for Use in Loading Toll Engrance and Intermediate Cables—Bulletin No. 107.
(Dec. 8-23)
(Transmits Bulletin No. 107—Subject: Same as G. E. C.)

1322 Loading Data Section II-G—Loading Coil Cases for Office Installations—Bulletin No. 90.
(Dec. 8-23)
(Transmits Bulletin No. 90 — Subject: Same as G. E. C.)

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1323 Fanning Strips for Cable Terminals.
(June 30-23)

1324 Securing Data on Busy Subscribers' Lines—Machine Switching Equipment.
(July 6-23)
(Transmits Dwg. 706-371 "Method of Securing Overflow Data on Busy Line")

1325 Bonita Cable Rings.
(July 9-23)
(Transmits Specifications No. 4199 Bonita Cable Rings—Specs. contain Dwgs. 46-L-15, 46-L-138, 46-L-148 and 46-M-118)

1326 Terminal Tag.
(July 7-23)
(Transmits Drawing 46-L-105)

1327 Body Belts and Safety Straps.
(July 6-23)
Supplementing G. E. C. 993
(Transmits Amendment No. 1 to Specs. 4070 Body Belts and Safety Straps)

1328 Public Address Systems. Section III-A Roll Call Transmitter — Amplifier Set. Bulletin No. 75.
(July 16-23)
Supplementing G. E. C. No. 1195
(Transmits Bulletin No. 75 Roll Call Transmitter-Amplifier Set)

1329 Rubber Tape.
(July 10-23)
Replacing G. E. C. #881

1330 Substations—Use of Transmitters and Receivers with Non-Standard Apparatus.
(July 9-23)
(Transmits Photograph)

1331 "B" Tree Guard.
(July 11-23)
Replacing G. E. C. No. 790
(Transmits Dwg. 46-L-143 "B" Tree Guard)

1332 Clipping Knife.
(July 17-23)
(Transmits Dwg. 46-L-117 Clipping Knife)

1333 Fanning Strips for Protected Building Terminals.
(July 20-23)
Replacing in Part G. E. C. 968
(Transmits Dwg. 46-X-62, No. 10 and No. 11 Fanning Strips)

1334 Substations—Coin Collectors—No. 50 Type for Post-payment Service.
(Oct. 24-23)
(Transmits Dwg. 200-B-44)

1335 Toll Switchboard No. 1—Messenger Call Signal System.
(Aug. 13-23)
(Transmits Dwg. 196-B-37, 201-B-22 and 201-B-23)

1336 Combined Use of 65 and 33 volt Charging Generators in Panel Machine Switching Offices
(Aug. 15-23)
(Supplementing and Replacing in part G. E. C. No. 1282)
(Transmits Bulletin No. 100. Subject—Use of 65 Volt Generators in Machine Installing Offices)
[fol. 15419]

1337 Substations—Test Sets—Battery for 17-D and 17-E Lineman's Sets (Transmits Dwg. 200-B-61, No. 17-D and 17-E Test Sets)
(July 31-23).

1338 Maintenance of Main Frame Heat Coils and Protector Springs—No. 22-B Test Set.
(Aug. 1st-23)
Supplementing G. E. C. No. 580.
(Transmits, "Notes on the Operation of the No. 22-B Test Set)

1339 Phantom Repeating Coils.
(Nov. 15-23)
Replacing G. E. C. 1168
(Transmits Bulletin No. 91—"Characteristics of Nos. 75 & 76 types of Phantom Repeating Coils", and Notes entitled Uses of Equality and Inequality Ratio Phantom Repeating Coils.

1340 Printing Telegraph Service—Booklet for Patrons.
(Aug. 15-23)
Supplementing G. E. C. 1087
(Transmits Booklet "C" Printing Telegraph Service)

1341 Specifications No. 4039—"Cable Terminating".
(Aug. 29-23)
(Transmitting Handbook Specs. No. 4039 same subject as G. E. C.)

1342 Transmission Maintenance Practices—New Numbering System and Printing of Sections by the Western Electric Company.
(Aug. 28-23)
(Transmits List of Current Sections)

1343 Covers for No. 14 Cable Terminals.
(Aug. 14-23)

1344 Sag Gauge.
(Sept. 5-23)
(Transmits Dwg. 46-M-150 Sga. Gauge)

1345 Linemen's Hand and Test Sets—Standard Cords and Change in Finish.
(Aug. 25-23)

1346 Specifications 4130 "A. S. A." Cable.
(Aug. 31-23)
Supplementing G. E. C. 1174, Replacing G. E. C. 494. Replacing Specifications 3729
(Transmits Specifications 4130 A. S. A. Cable)

1347 Standardization of Lengths of Stub on No. 14 Cable Terminals.
(Aug. 30-23)

1348 Storage Battery System for Supplying Message Register Current in Manual Offices.
(Sept. 10-23)
Partly Replacing G. E. C. No. 745
Replacing Specs. No. 3761.
(Transmits Bulletin No. 99—Subject same as G. E. C.)

1349 Terminal Marking Outfit.
[fol. 15420] (Sept. 5-23)

1350 Terminal Clamp.
(Sept. 11-23)
(Transmits Dwg. 46-x-77 — Terminal Clamp)

1351 Eye Bolt Method for Dead Ending Strand and Attaching Guys.
(Sept. 4-23)
(Transmits—Handbook Specs.—"Strand Dead End and Guy Attachments"—Eye Bolt Method—Instructions for Field Trial Only)

1352 Provisional Specifications No. 4279 "Lead Sleeving".
(Sept. 7-23)
Replacing G. E. C. 543
Replacing Provisional Specifications No. 3626
(Transmits Prov. Spec. No. 4279 Lead Sleeving)

1353 Devices for Securing Cable Clamps to Masonry.
(Oct. 11-23)
(Transmits Bulletin No. 95, Subject Same as G. E. C.)

1354 Machine Switching–Handling Directory Errors.
(Sept. 28-23)
(Transmits Appendices I and II)

1355 Local Switchboard No. 1 "A" Cord and Inter-Office Trunk.
(Supervisory Relays—Tests and Adjustments)
(Oct. 2-23)
Replacing in part G. E. C.'s Nos. 496 and 1036
(Transmits "notes" subject same as G. E. C.)

1356 Loading Data—Section I-A Designation of Loading Systems. Bulletin No. 106.
(Dec. 8-23)
(Transmits Bulletin No. 106. Subject: Same as G. E. C.)

1357 Telephone Repeater Data—Section VI-E—"22" Type Panel Mounted Telephone Repeaters (Reading Type) Bulletin No. 84.
(Oct. 29-23)
Supplementing G. E. C. #714
(Transmits Bulletin No. 84—"22" Type Panel Mounted Telephone Repeaters (Reading Type)

1358 Telephone Repeater Data — Section VII-B—Foreign Wire System Employing "Reading Type" Repeaters and Associated Apparatus —Bulletin No. 97.
(Nov. 7-23)
(Transmits Bulletin #97. Subject same as G. E. C.)

1359 Changes in Charging Motor Generator Sets and Control Apparatus.
(Oct. 3-23)
Supplements and replaces in part G. E. C. #511
(Transmits Bulletin No. 101. Subject same as G. E. C.)

1360 Transmission Maintenance Practices—Section II-G—Subject "Description of 6-B Oscillator"—Bulletin No. 110.
(Transmits Bulletin No. 110. Subject same as G. E. C.)

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1361 Power Plants for Step-by-Step Machine Switching Offices.
(Oct. 5-23)
(Transmits Bulletin No. 104. Subject same as G. E. C.)

1362 Carrier Current Systems Data—Sections VI-A and VI-B Floor Type Repeater. Bulletin No. 82.
(Dec. 31-23)
Supplementing G. E. C. No. 1031
(Transmits Bulletin No. 82 Sections as above) (Order on W. E. Co.)

1363 First Aid Supplies.
(Oct. 1-23)
Replacing G. E. C.'s Nos. 956 and 1015
Replacing in part G. E. C. No. 1243
Supplementing G. E. C.'s Nos. 920 and 1243
(Transmits Specs. covering changes, See G. E. C. for list)

1364 Telephone Repeater Data—Section VIII-A—Automatic Filament Current Regulating Circuit—Bulletin No. 114.
(Dec. 13-23)
(Transmits Bulletin No. 114. Subject: Automatic Filament Current Regulating Circuit)

1365 Apparatus Blanks for Covering Banks of Unused Subscribers Multiple Jacks.
(Sept. 19-23)
(Transmits Dwg. 38-Y-1413—Apparatus Blanks for Covering Unused Multiple Jacks)

1366 Transmission Practices—Section VI-B—Methods for Making Transmission Tests on Step-by-Step Machine Switching Circuits and Equipment.
(Sept. 27-23)
(Transmits as above)

1367 Square Washers.
(Oct. 10-23)
(Supplements G. E. C. 1112
(Transmits Dwg. 46-L-88—Issue 2)

1368 Bulletin Holder for Use on Switchboard Sections.
(Oct. 15-23)
(Transmits Dwg. 192-B-34)

1369 Carrier Current Systems Data—Sections V-C and D—"Carrier Telegraph System Terminal—Type "B"—Bulletin No. 94
(Oct. 26-23)
Replaces in Part G. E. C. No. 1031
(Transmits Bulletin No. 94—Carrier Telegraph System)

1370 Stove Bolts.
(Oct. 10-23)
(Transmits Dwg. 46-L-41 Stove Bolts)

1371 Maintenance Tools for No. 14 Cable Terminals.
(Oct. 19-23)
(Transmits Dwgs. 46-M-65 Terminal Drip Pan
46-X-72 Spray Cleaner
46-X-73 Water Tool
46-X-15 Compressed Air Sprayer)

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1372 Substations—Test Sets No. 17 Linemen's Type.
(Oct. 18-23)
(Transmits Dwg. 146-A-58—Carrying Case for No. 17 Test Set)

1373 Crosstalk Practices Section V-A—50-A Crosstalk Set—Bulletin No. 80.
(Nov. 1-23)
Replacing G. E. C. 181
(Transmits Bulletin—subject same as G. E. C.)

1374 No. 29-B Binding Post.
(Oct. 13-23)
(Transmits Dwg. 46-X-78)

1375 Telephone Repeater Data—Section II-B Singing Point Data.
(Oct. 31-23)
(Supplementing G. E. C. 826)
(Supplementing G. E. C. 891)
(Transmits Data as per above)

1376 Central Office Telegraph Practices—Section III-D, Two-Way Non-Duplex Polar Telegraph System, Bulletin No. 113.
(Nov. 2-23)
(Transmits Bulletin No. 113—Section III-D "Two-Way Non-Duplex Polar Telegraph System)

1377 Clearing Substation Grounds on No. 26 and No. 27 Protector Blocks by Means of 200-Volt Breakdown Test.
(Oct. 23-23)
Supplements G. E. C. No. 560

1378 Line Thermometer.
(Nov. 5-23)
(Transmits Dwg. 46-X-74—Line Thermometer)

1379 Chestnut Poles.
(Oct. 23-23)
Supplementing G. E. C. No. 1136
Transmits Amendment No. 1 to Specs. No. 4166—Chestnut Poles

1380 Guy Rule.
(Nov. 9-23)
Replaces G. E. C. No. 1030
(Transmits Dwg. 145-A-39, Guy Rule and Sample Rule)

1381 Substations—Tools and Gauges—Shellac Set for Installer and Repairmen.
(Nov. 13-23)
(Transmits Dwg. No. 201-B-90—Shellac Set)

1382 Copper Sleeves and Tinned Steel Sleeves.
(Nov. 7-23)
Supplementing G. E. C.'s 1027, 1035 and 1132
(Transmits Amend. No. 1 to Specs. 4139 "Copper Sleeves"
Dwg. 46-L-35 Issue 3. "Gauges for Copper Sleeves" and Amend. No. 2 to Specs. 4137 "Tinned Steel Sleeves")

1383 Morse Line Terminal Designation Strip—No. 91-A.
(Nov. 1-23)

1384 Toll Signaling Equipment—Adjustable Back-Stop for No. 150 Type Relays.
(Nov. 15-23)
Supplementing G. E. C. No. 1294
(Transmits Bulletin 111. Subject Same as G. E. C.)

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1385 Transmission Maintenance Practices—Section II-H "8-A Oscillator" Bulletin No. 115.
(Dec. 14-23)
(Transmits Bulletin No. 115-8-A Oscillator)
(Order on W. E. Co.)

1386 Method of Operation of Step-by-Step Machine Switching Equipment. Corrected and Additional Pages for G. E. C. No. 1076.
(Nov. 28-23)
Replaces in Part and Supplements G. E. C. No. 1076
(Transmits Corrected and Additional Pages for G. E. C. No. 1076)

1387 Printing Telegraph Service—Improved Distributor Brush.
(Nov. 12-23)
Supplementing G. E. C.'s Nos. 1170 and 1194.

1388 Central Office Telegraph Practices—Section I-E Telegraph Subscribers Calling-In Signal.
(Dec. 3-23)
Replacing in Part G. E. C. No. 898
(Transmits Section I-E of Central Office Telegraph Practices)

1389 Corner Brackets.
(Dec. 5-23)
Replacing in Part G. E. C. 790
(Transmits Dwg. 46-L-232 "Corner Brackets"

1390 Transmission Maintenance Practices Sections I-B—1-B Transmission Measuring Set—Bulletin No. 116.
(Dec. 21-23)
Supplements G. E. C. No. 1034. (Order on W. E. Co.)
(Transmits Bulletin No. 116—Subject 1-B Trans. Measuring Set)

1391 British Creosote.
(Nov. 27-23)
(Transmits Specs. No. 4263—British Creosote)

1392 Screw Coupling Duct Rods.
(Jan. 5-24)
(Transmits Dwg. 46-M-144—Subject same as G. E. C.)

1393 Metal Stock Box.
(Dec. 11-23)
(Transmits Dwg. 46-X-65—Metal Stock Box)

1395 Machine Switching Offices—Temporary Positions for Operators and for Sender Monitors.
(Jan. 3-24)
Replacing G. E. C. No. 1023 and G. E. C. No. 1058

1396 Enamel Insulated Cable and Wire.
(Dec. 11-23)
Supplementing and Replacing in Part G. E. C. No. 460

1397 Substations—Improved Mouthpiece for Transmitters.
(Dec. 15-23)
(Transmits Photo Showing Mouthpiece)

1398 Substations—Public Telephone Signs.
(Dec. 26-23)
(Transmits Specifications No. 4290—Public Telephone Signs.) (Enameled Type)

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1399 New Type of Power Protection Panel, Choke Coil and Lightning Arrester.
(Jan. 10-24)
Partly replacing G. E. C. No. 817
(Transmits Dwg. 203-B-51 and 146-A-100)

1400 One Inch Insulated Screw Eyes.
(Jan. 9-24)
Replacing G. E. C. No. 843
(Transmits Dwg. 46-L-193. 1" Insulated Screw Eyes)

1401 Rubber Glove Containers.
(Jan. 7-24)
Supplementing G. E. C. #1301
(Transmits Dwg. 46-X-61 "Rubber Glove Envelope" and 46-M-141 "Rubber Glove Bag")

1402 Bridle Rings.
(Jan. 11-24)
Supplementing G. E. C. No. 1041
(Transmits Amend. No. 1 to Spec. 4110)

1403 Telephone Repeater Data—Section IV-B Toll Service Observing Nos. 11-A-1 and 11-A-2 Repeaters—Bulletin No. 109
(Jan. 15-24)
Supplementing G. E. C. No. 812
Transmits Bulletin No. 109. Subject same as G. E. C.

1404 Douglas Fir Guard Arms and Creosoted Yellow Pine Guard Arms.
Replacing in Part G. E. C. No. 774.
(Jan. 11-24)
(Transmits Amend. No. 1 to Specs. 3936 Douglas Fir Guard Arms)
(Transmits Amend. No. 1 to Specs. 3937 Creosoted Yellow Pine Guard Arms)

1405 Outside Plant Testing Apparatus: No. 19-C Test Set (Exploring Coil) and No. 20-C Test Set.
(Jan. 10-24)
Replacing G. E. C. No. 608
Replacing G. E. C. No. 1071
(Transmits Dwg. 46-M-89—No. 19-C Test Set)

1406 Handling of Explosives.
(Jan. 10-24)
Replacing G. E. C. Nos. 776,932 and 1146
Supplementing G. E. C. No. 1021

1407 Cable Tags.
(Jan. 10-24)
(Transmits Dwg. 46-L-249—Cable Tags)

1408 R and S Cable Balconies.
(Jan. 25-24)
Replaces G. E. C. 1184
(Transmits Issue 3 to Dwg. 143-A-4 "R" Balcony and 143-A-5 "S" Balcony)

1409 Western Cedar Poles.
(Jan. 21-24)
Replacing G. E. C. No. 187
(Transmits Specifications 4283. Western Cedar Poles)

1410 Creosoted Yellow Pine Poles—Amendment to Specifications.
(Feb. 1-24)
(Supplementing G. E. C. 1250)
(Transmits Amend. No. 1 to Specs. No. 4209 and Dwg. 46-M-30. Iss. 3)

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1411 "Steel Tie Wires".
(Jan. 28-24)
(Transmits Specifications No. 4252—Steel Tie Wires)

1414 Paraffin Trough.
(Jan. 24-24)
(Transmits Dwg. 46-L-268 Paraffin Trough)

1415 Gauge for Cable Clamps and Cable Clamp Rings.
(Jan. 25-24)
Supplementing G. E. C. 1212
(Transmits Dwg. 46-L-94 Issue 5—Gauge for Cable Clamps and Cable Clamp Ring)

1416 Paints for Terminal Markings.
(Jan. 26-24)

1417 Telephone Repeaters—Modification of Potentiometer in Unit Rack Floor Mounted Cord Circuit Repeaters
Supplementing G. E. C. No. 714

1421 Technical Features of Wire Telephony as an Adjunct to Radio Broadcasting and Public Address Systems.
(Jan. 31-24)
Supplements G. E. C. No. 1195
(Transmits Bulletin No. 121—Subject Same as G. E. C.)
(Suppl. by G. E. C. 1424)

1424 3-A Speech Input Equipment.
(Feb. 7-24)
Supplements G. E. C. No. 1421
(Transmits Bulletin No. 120 Subject Same as G. E. C.)

[fol. 15426] B—List of Specifications, Including 94 that are in Handbook Form.—Side Folios 15426 to 15455

*Specifications that are printed in handbook form are indicated by an asterisk.

**Obsolescent specifications are indicated by a double asterisk.

198	Butting Board (For guiding a pole into a hole).
359-C	Pole Dinkey (For carrying poles).
**636	Protection of Power circuit entering building.
**703	Steel Framework for Central Office Equipment.
**1143	Inspector's Test Table #5.
**1143-A	Wire Chief's Desk #5—Method of Operating.
1346	Local Chief Operator's Desk #3.
1522	Toll Chief Operator's Desk #2.
**1572	Woodwork and Leather for Central Office Equipment.
**1574	Slate used in Central Office Equipment.
1581	Gas Engine for Use in Telephone Exchanges.
**1598	Five Pair Armored Submarine Cable.
**1600	Ten Pair Armored Submarine Cable.
1605	Eleven Pair Lead Covered Submarine Emergency Cable.
1606	Twelve Pair Emergency Line Cable.
1608	Standard Reel Rack.
1609	Seven Pair Emergency Line Cable.
**1625	Toll Test Board No. 2.

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**1626	Toll Test Board No. 1.
**1627	Wire Chief's Desk #6.
**1627-A	Method of Operating Wire Chief's Desk #6.
**1628	Chief Operator's Desk #5.
**1634	Pole Changes.
**1645	Central Office Equipment with Relay Switchboard #8.
1672	Lead Covered Cable with Wool Insulation for Inside Construction.
1678	Manager's Desk #7.
**1688	Standard Fuller Battery Solution.
1707	Information Desk #5.
1713	Dead Man.
1719	Nails (Galvanized and Tinned).
1721	Special Rock Guy Bolt.

1738 Fifteen Conductor Emergency Cable Reel.
1739 Hard-Drawn Copper Wire.
1741 Portable Service Testing Set #1.
1766 One Pair Emergency Cable Reel.
1775 One Pair Emergency Cable.
1789 Description of Central Office Equipment with Relay Switchboard #9.
1798 Manhole Guard.
1807 Installing a Gas Engine for Use in Telephone Exchanges.
1812 Cable Box Seat.
(Supplemented by G. E. C. 701)
1818 Stringing Hard Drawn Copper Wire.
1841 Wire Chief's Desk #7.
**1846 Red Cedar Poles.
**1849 Copper Sulphate.
1862 Chief Operator's Desk #6.
[fol. 15428]
1914 Manager's Desk #6.
1915 Chief Operator's Desk #7.
1916 Chief Operator's Desk #8.
1926 Light Galvanized Steel Seven Wire Strand (Mild Steel).
**1933 Wiring of a Central Office Equipment.
**1937 Central Office Equipment with Relay Switchboard #9 for Small Office with single position.
1948 Chestnut Poles.
1967 Fire and Sand Pails.
1991 Hole Cleaner.
2009 Preliminary specifications for the Installation of Office Terminals of Wool Insulated Cable.
**2013 Waterproof Coverings for Central Station Equipment.
2036 Inspection of a Dirt Auger.
2052 Inspection of a Joint Twister for Double Tube Sleeves.
2055 Crossarm Cleats.
2061 Asbestos Blanket with Containing Case.
**2075 Galvanized Steel Suspension Wire.
2078 Cleats and Binding Posts for Cable Boxes.
(Supplemented by G. E. C. 767)

2079 Instructions Governing the Use of Dynamite.
(Supplemented by G. E. C. 489)
(See also Specs. 3734)

••2092 Inspection of #4 Protectors and Associated Apparatus.

2133 Inspection of a Box for Holding Protector Parts and Tools in Cable Boxes.

2162 Ten Pair Bridle Wire Cable.

2163 Five Pair Bridle Wire Cable.

••2166 Wire Chief's Desk #8.

••2166-A Description of the Method of Operation for Wire Chief's Desk #8.

••2167-A Description of the Method of Operation for Wire Chief's Desk #9.

••2167 Wire Chief's Desk #9.

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••2168 Toll Test Board #3.

••2168-A Method of Operation for Toll Test Board #3.

2221 Inspection of Chestnut Poles.

2244 Hand Magazine for Dynamite.

••2246 Lockers.

2251 Standard Combination Reel.

2314 Instructions for Connecting Special Steel and Copper Wire at Long Spans.

2316 Six Pair Bridle Wire Cable.

2327 Chief Operator's Desk #9.

2391 Solder Copper Holder (For Holding Hot Soldering Copper).

2426 Tie Wires.

2430 An Extension Fixture.

2435 Structural Steel.

2437 Balcony for Cable Poles for Use with Narrow Cable Boxes.
(Supplemented by G. E. C. 701)

2448 Lead Covered Paper Insulated Bridle Cable.

2462 Balcony for Cable Poles.
(Supplemented by G. E. C. 701)

2472 Wall Tent Stones.

••2487 Provisional Specs. for the Construction of Rural Lines.

2597 Creosoted Gum Plank.

2642 Standard Green Pole Paint.

2688 Description of a Central Office Equipment with Relay Switchboard No. 10.
2746 Chief Operator's Desk #10.
2747 Wire Chief's Desk #10.
2747-A Method of Operation Wire Chiefs' Desks #10 and #11.
*2770 Instructions for the Maintenance Inspection of Crossarms and Guying.
2807 Five (5) Wire Crossarm Cleat #2.
[fol. 15430]
*2842 Long Distance Toll Line Terminal Construction.
(Supplemented by G. E. C. 767)
2868 Serving Board (For serving spun yarn around armor wires in Sub Cable)
*2877 Construction of 40 to 80 Wire Pole Lines.
(Supplemented by Specs. 3636)
(Replaced in Part by G. E. C. 563)
2880 6,000 Pound Strand.
2881 10,000 Pound Strand.
2882 16,000 Pound Strand.
2901 Toll Supervisors' Set #4.
2902 Toll Supervisors' Set #5.
2906 Creosoted Blocks for Three Block Anchors.
2919 Wire for Lightning Arresters T-533-B.
2920 Wire Chief's Desk—Wall Type #11.
2921 Inspection of a Cant Hook.
2922 Instruction for Use of Creosoted Three Block Anchors.
2931 Pike Poles.
2959 Method for the Analysis of Solder.
2960 Aerial Cable Hangers.
2971 Dowel Pins.
2980 Protection of Telephone Lines Crossing High Potential Lines—Short Span Method of Protection.
2986 Toll Ticket Filing Desk #1.
2987 Toll Directory Desk No. 1.
**2995 Substation Ground Wire.
3001 Transposition Glass Insulators.
3007 Distributing Frame Wire.
(Supplemented by G. E. C. 615)

3011 Inspection of a Long Handle Shovel.
3011 Amendment to Specs. 3011 for the Inspection
[fol. 15431] of Long Handle Shovel.
3012 Inspection of a Digging Spoon.
3021 7000 Pound two-wire galvanized steel Strand.
3030 Treated and untreated square and round conduit plugs.
3040 (Provisional) Installation of Iron Case Loading Coils on Open Wire Lines.
(Supplemented by Specs. 3525)
3049 Steel Prod.
3065 Malleable Castings.
3066 Treated Wrought Pipe and Lap Welded Casing.
3069 Guy Clamps.
(Supplemented by G. E. C. 276 and 561)
3070 Crossarm Bolts.
(Supplemented by G. E. C. 276)
3071 Staples.
(Supplemented by G. E. C. 276)
3074 Rock Guy Bolts.
(Supplemented by G. E. C. 276 and 561)
3076 Extension Fixture Braces.
(Supplemented by G. E. C. 276)
3077 Thimbles.
(Supplemented by G. E. C. 276)
3078 Washers.
(Supplemented by G. E. C. 276)
(Replaced by G. E. C. 1112 Specs. 4149)
3079 Back Braces.
(Replaced by Specs. 4182 (G. E. C. 1201)
3080 Carriage Bolts.
(Supplemented by G. E. C. 276)
3081 Guy Rods.
(Supplemented by G. E. C. 276)
3082 Drive Screws.
(Supplemented by G. E. C. 276)
3094 Weatherproof Copper Wire.
3096 Creosoted Plank.
3097 Strain Insulators.
[fol. 15432]
3103 Instructions for Making Phantom Circuit Transpositions.
(Replacing in part G. E. C. 43)

3110 Galvanizing for Iron and Steel.
3111 Guy Chain.
3115 Creosoting Douglas Fir Duct and Small Douglas Fir Timber.
(Replaced by Specs. 4242)
**3117 Wire Chief's Desk #2.
**3117-A Method of Operation for Wire Chief's Desk #2.
3120 Phantom Circuit Transpositions.
(Replaced in part by Specs. 3736. See G. E. C. 563)
3123 Tin Coating on Copper Wire.
3124 Malleable Iron Clamp.
(Supplemented by G. E. C. 561)
3132 Cribbing Guards. (1908)
3138 Creosoted Plank for Two Block Anchors.
3138 Creosoted Plank for Two Block Anchors Amendment #1 (G. E. C. 1297).
3139 Tamping Bar.
(Replaced by Specs. 4156)
3140 Digging Bar.
(Replaced by Spec. 42041 G. E. C. 1226)
3142 Paper Sleeves for Splicing Paper Insulated Cables.
3145 Making Phantom Circuit Transpositions with Pole Circuits on Adjacent Arms as Side Circuits.
3146 Phantom Circuit Transpositions with Pole Circuits as Side Circuits.
(Replaced in part by Specs. 3736. See G. E. C. 563)
3152 Wooden Pole Steps.
3153 Crossarm Paint.
3154 Provisional Specifications for Long Open Wire Spans at River Crossings.
3156 Creosoting Timber.
3163 Galvanized Best-Best Iron Wire.
3164 Galvanized Steel Wire.
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3166 Installation and Operation of Pole Relays #191-A.
3167 Galvanized Steel Wire for River Crossings.
*3176 Installation of Local Telegraph Sounders.

3178 Serving Iron (For binding iron wire over the armor wires in Sub. Cable).
3180 Lightning Arrester T-533-B.
3184 Steel Cable Crossarms Nos. 1, 2 and 3.
3187 Provisional Specifications for the Installation of Bridle Wire Electrose Insulators.
3188 Standard Black Pole Paint.
3189 Standard White Pole Paint.
3194 Pole Line Brackets.
3195 Wooden Tree Blocks.
3196 Galvanized Bridle Rings.
3197 Cable Rack.
3198 Hooks for Cable Racks.
3200 Galvanized Pole Brackets.
(Supplemented by G. E. C. 276)
3200 Amendment to Specs. No. 3200—Galvanized Pole Brackets.
3203 Crossover Clamps.
(Supplemented by G. E. C. 276 and 561)
3204 Steel Angle Support for Long Span Wire Hanger on Pole Fixture.
3210 Bridle Cable Hanger.
•3211 Stub Reinforcement for Poles.
(Replaced by Spec. 3926)
3212 Single and Twisted Pair Braided Rubber Covered Wire for Morse Circuits.
3213 Galvanized Strain Plates.
(Supplemented by G. E. C. 276)
3216 Transposition Bracket for Double Petticoated Porcelain Insulators.

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3231 Creosoted Yellow Pine Crossarms.
(Supplemented by G. E. C. 284 and 583)
3232 Creosoting Yellow Pine Crossarms. (1911)
3234 Creosoted Yellow Pine Stubs for Pole Butt Reinforcements.
•3235 Exchange Aerial Construction.
(Supplemented by G. E. C. 178, 193, 257, 441, 452, 630 and 641)
(Supplemented by Specs. 3636)
3237 Tree Wire.
3252 Insulation and Operation of Composite Ringing Set for Tel. Lines.
(Replaced by G. E. C. 1294)

3254 Eastern White Cedar Poles. Amendment No. 1 (G. E. C. 1133).

3254 Eastern White Cedar Poles. Amendment No. 2. (Replaces Amend. No. 1)

3258 Preliminary Specifications for the Installation of Iron Case Loading Coils on Phantom Open Wire Lines for Phantom Circuits 1-2-3-4, 3-4-5-6, 5-6-7-8 and 7-8-9-10.
(Supplemented by Specs. 3525, 3620 and 3751)

3265 Preliminary Specifications for the Installation or Iron Case Loading Coils T-685 on Open Wire Lines for Circuits 1-2 and 3-4 and Corresponding Circuits on Other Arms. Arranged so that Phantom Coils T-680 may be installed on these circuits at some Future Time.
(Supplemented by Specs. 3525, 3620 and 3751)

3276 Toll Line Glass Insulators.

3278 Preliminary Specifications for the Installation of Phantom Loading Coils T-680 on Open Wire Lines for Phantom Circuit 5-6-7-8 and Corresponding Circuits on Other Arms. Arranged so that Loading Coils T-685 may be Installed on These Circuits at Some Future Time.
(Supplemented by Specs. 3525, 3620 and 3751)

3286 Inspection of Worn #49 Jacks.

3287 Inspection of Worn Plugs #109 and #110.

3291 Installation of Phantom Loading Coils T-680 on Open Wire Lines for Phantom Circuits 1-2-3-4, 3-4-5-6 and 7-8-9-10 and Corresponding Circuits on Other Arms. Arranged so that Loading Coils T-685 may be Installed at Some Future Time.
(Supplemented by Specs. 3525, 3620 and 3751)

3292 Beeswax Compound.

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3295 Galvanized Pole Steps.
(Supplemented by G. E. C. 276)
(Replaced by Spec. No. 4146)

3297 Galvanized Aerial Cable Rings.
(Supplemented by G. E. C. 649)

3298 Galvanized Pothead Support.
(Supplemented by G. E. C. 276)

3299 Cotton Sleeving.

3302 Pole Tongs.

3316 Galvanized House Bracket for Dead-Ending Copper-Steel Drop Wires.
(Supplemented by G. E. C. 276)
(Amend. No. 1 G. E. C. 1245)

3326 Cable Suspension Clamps.
(Supplemented by G. E. C. 276 and 561)

3327 Instructions for Placing Loading Coil Cases and Connecting Loading Coils to Underground Cable Conductors used in Parallel.

3328 Galvanized Corner Bridle Rings.
(Replaced by Spec. 4244) G. E. C. 1315.

3343 Exchange Line Glass Insulators.

3347 Weatherproof Iron and Steel Wire.

3348 Wooden Insulator Pins.
(Supplemented by G. E. C. 613)

3352 Creosoted Wood Conduit.

3355 Vitrified Clay Conduit.

3356 No. 22 Gauge Cable.
(Replacing Specs. 3226)

3357 No. 19 Gauge Cables.
(Replacing Specs. 3227)

3371 Preliminary Specifications for the Installation of a #44-C Retardation Coil on Open Wire Circuits to Obtain a Rural Line Phantom.

3381 Western White Cedar Poles and Guy Stubs.

3382 Galvanized Bolts for Cable Suspension Clamps.
(Supplemented by G. E. C. 276 and 561)
(Replaced by Specs. 4197—G. E. C. 1271)

3385 Galvanized Sheet Iron Cable Shields.

[fol. 15436]

3393 Sawed Redwood Poles.

3396 Dipping Douglas Fir Crossarms in Hot Carbolineum.

3397 Painting Crossarms (1912).

3414 Specifications for Overhead Crossings of Electric Light & Power Lines.

3426 Porcelain Knobs (See G. E. C. 1299 for Issue #4 of Dwg. 89-E5 to Specs. 3426).

3428 Insulating Sealing Compound.
3431 Carbolineum and Similar Wood Preserving Oils.
(Supplemented by G. E. C. 512 and 581)
3432 Analysis of Carbolineum and Similar Wood Preserving Oils.
3436 Toll Test Board #4. Description of Apparatus and Methods of Testing.
3438 40-60 Solder.
(Supplemented by G. E. C. 568) (1911)
3438 Amend. to Specs. 3438—40-60 Solder.
3439 45-55 Solder.
(Supplemented by G. E. C. 568)
3439 Amend. to Specs. 3439—45-55 Solder.
3440 50-50 Solder.
(Supplemented by G. E. C. 568)
3440 Amend. to Specs. 3440—50-50 Solder. (Amend No. 2 G. E. C. 1099.)
3441 Rosin Flux Wire Solder.
3441 Amend. to Specs. 3441 Rosin Flux Wire Solder.
} Replaced by Specs. 4152
3443 Pothead Wire.
3444 Installation and Maintenance of an Automatic Switch in Electrolysis Drainage Wires.
3445 Toll Test Board #4.
3446 Wheatstone Bridge #111077—Toll Test Board #4.
3448 Cement.
3449 Inspection of Cement.
3455 Lead-Antimony Cable Sheath.

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3504 Double Petticoated Glass Insulators.
3505 Rack for Composite Sets and Composite Ringer Sets.
3522 Replacement and Reinforcement Inspection of Pole Lines.
(Supplemented by G. E. C. 685)
3525 Preliminary Specifications for the Installation of Loading Coils T-300, T-680, T-685 on Open Wire Lines.
(Supplementing Specs. 3040, 3258, 3265, 3278 and 3291)
3529 Crossarm Braces.
3531 Hub Guards.

3535 Voltmeter No. 12002 used with Toll Test Board No. 4.
(Replacing Specs. 3171)

3536 Mil-Ammeter No. 111076 used with Toll Test Board No. 4.

3537 Volt-Mil-Ammeter No. 121037 used with Morse Board No. 4.

3542 Master Specifications for Single Armored Submarine Cable with Single Wrapped Conductors.
(Replacing Specs. 2159)

3543 Master Specifications for Double Armored Submarine Cable with Single Wrapped Conductors.
(Replacing Specs. 2159)

3544 Master Specifications for Double Armored Submarine Cable with Double Wrapped Conductors.
(Replacing Specs. 2159 and 3361)

3545 Master Specifications for Single Armored Submarine Cable with Double Wrapped Conductors.
(Replacing Specs. 2159 and 3362)

3546 No. 17 Gauge Tinned Copper-Steel Wire.

3549 One Point Transposition Brackets.
(Replacing Specs. 3106)

3550 Steel Pins for Transposition Brackets.
(Replacing Specs. 3060 and 3225)
(Supplemented by G. E. C. 561)

3551 Composite Sets for Telephone Lines.
(Replaced by Specs. 4064)

3554 Artificial Cables for Use in Transmission Testing.

3558 Bridge Polar Duplex Telegraph System.
(Replacing Specs. 3174)
(Supplemented by G. E. C. 631, 633 and 645)

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**3559 No. 1-B Telegraph Repeater Set.

3560 Equipment for Public News Telephone Service.

*3613 Underground Conduit Construction.
(Replacing Specs. 2891 and 3509)

3617 (Confidential). Preliminary Specifications for the Installation of Phantom Circuit Loading Coils No. 511 (T-680), Side Circuit Loading Coils No. 512 (T-685) and Lightning Arresters (T-533-B) on Open Wire Lines for Circuits 5-6-15-16 and Corresponding Circuits on Other Arms.
(Supplemented by Specs. 3751)

3620 (Confidential). Preliminary Specifications for the Installation of Loading Coils No. 511 (T-680) and No. 512 (T-685) on Open Wire Lines, Spacing Coils and Grouping Coils at Loading Points.
(Supplementing Specs. 3258, 3265, 3278 and 3291)

3623 Installation and Operation of Simplex Sets.
(Replacing Specs. 3557)

3626 Provisional Specifications for Lead Sleeving.
(Replacing Specs. 3018)
(Replaced by Specs. 4279)

*3627 Provisional Specifications for the Brush Treatment of Poles.

3629 (Confidential). Preliminary Specifications for the Installation of Phantom Circuit Loading Coils No. 511 (T-680), Side Circuit Loading Coils No. 512 (T-685) and Lightning Arresters (T-533-B) on Open Wire Lines. "H" Fixture Construction Along the Line. (1914)

3634 Standard Intermediate Distributing Frames.

3636 Crossings of Wires or Cables of Telegraph, Telephone Signal and Other Circuits of Similar Character over Steam Railroad Rights of Way, Tracks or Lines of Wire of the Same Classes.
(Supplementing Specs. 2851, 2877, 2942 and 3235)
(Supplemented by G. E. C. 530)
(Replaced by Specs. 4190)

*3639 Transposing Single and Phantom Circuits and Dead-Ending Wires at Test and Terminal Poles, Each Wire Attached to a Separate Insulator.
(Replacing Specs. 3293)
(Replaced in Part by Specs. 3928)

3640 Specifications for Ringing Dynamotors.
(Replacing Specs. 3246)

3641 Specifications for Ringing Generators.
[fol. 15439] (Replacing Specs. 3245)

3642 Specifications for Direct-Current Motors.
(Replacing Specs. 3510)

3643 Provisional Specifications for a Concrete Steel Reinforcement for Poles.
(Replacing Specs. 3284)

3644 Provisional Specifications for Gray Iron Castings.
(Replacing Specs. 3064)

3645 Provisional Specifications for Manhole Frames and Covers.

3646 Provisional Specifications for Conduit Castings.

3646 Provisional Specifications for Conduit Castings, Amend No. 1.

3647 Provisional Specifications for Reducing Couplings.

3647 Provisional Specifications for Reducing Couplings, Amend No. 1.

3647 Provisional Specifications for Reducing Couplings, Amend No. 3.

3648 Provisional Specifications for Cast Iron Pipe Bend.

3649 Provisional Specifications for Pulling-In Iron.

3650 Specifications for No. 22 Gauge Lead-Covered Silk and Cotton Insulated Cable Without Color Code.

3651 Specifications for No. 22 Gauge Lead-Covered Silk and Cotton Insulated Cable With Color Code.

3652 Specifications for Filled No. 22 Gauge Lead-Covered Silk and Cotton Insulated Cable With Color Code. (1913)

3654 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B) and Lightning Arresters T-533-B for Circuits 1-2-3-4 and Corresponding Circuits on Other Arms.
(Supplemented by Specs. 3683). (Jan. 1914)

3655 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B) and Lightning Arresters T-533-B for Circuits 1-2-3-4 and Corresponding Circuits on Other Arms. Instructions for Replacing Coils Nos. 511 and 512 (T-680 and T-685) on Existing Fixtures.
(Supplemented by Specs. 3683)

3656 Master Specifications for Armored Submarine Duplex Cable.
(Replacing Specs. 3478). (1914)

**3657 Composite No. 19 and No. 22 B & S Gauge Duplex Cable (1914).

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**3658 Provisional Instructions for Installing Duplex Cable Using Capacity Unbalance Testing Sets.
(Replacing Specs. 3527) (1914)

**3660 Master Specifications for Duplex Cable
(Replacing Specs. 3380) (1914)

3661 Standard Fuse Boards. (1914)

3662 Standard Subscribers' and Trunk Coil Racks (1914).

3662 Standard Subscribers' and Trunk Coil Racks, Appendix No. 1.

3663 Duplex No. 19 and No. 16 B & S Gauge Lead-Covered Silk and Cotton Insulated Cable.
(Replacing Specs. 3530) (1914)

*3664 Transposing Phantom Circuits Made Up of Pole Circuits on Adjacent Arms, Terminating Wires at Test Poles and Terminal Poles, Each Wire Attached to a Separate Insulator.

3665 Specifications for Charging Generators for Storage Batteries.
(Replacing Specs. 3513). (1917)

3667 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B and Lightning Arresters T-533-B for Circuits 3-4-5-6, 5-6-7-8 and 7-8-9-10 and Corresponding Circuits on Other Arms.
(Supplemented by Specs. 3683)

3667 Appendix No. 1 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B) and Lightning Arresters T-533-B for Circuits 4-5-6-7 and Corresponding Circuits on Other Arms.
(Supplemented by Specs. 3683)

3668 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B) and Lightning Arresters T-533-B for Circuits 3-4-5-6, 5-6-7-8, 7-8-9-10 and Corresponding Circuits on Other Arms. Instructions for Replacing Coils Nos. 511 and 512 (T-680 and T-685) on Existing Fixtures.
(Supplemented by Specs. 3683)

3669 Cleaning and Testing Transmitters and Receivers at Storerooms. (1914)

3674 Standard Relay Racks.
(Replacing Specs. 3637)

3681 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Side Circuit

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Loading Coils No. 550 (Case No. 20-F) and Lightning Arresters T-533-B for the Following Circuits and Corresponding Circuits on Other Arms.

1-2, 3-4
3-4, 5-6
5-6, 7-8
7-8, 9-10
5-6, 15-16

Odd Circuits
1-2, or 5-6
or
9-10

3682 Manila Rope.
(Replaced by Specs. 4218)

3683 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coils Nos. 549 and 550, Case No. 26-B) Attaching Three-Coil Unit to Pole. Guying Single Poles and "H" Fixtures Across the Line. (1914)
(Supplementing Specs. 3654, 3655, 3667 and 3668)

3685 Railroad Private Branch Exchange. Description of Equipment. (1914)

3686 Guy Hooks.
(Replacing Specs. 3121) (1915)

3697 Storage Batteries.— Chloride Accumulator Type.
(Replacing Specs. 2004)
(Replaced in part by G. E. C. 646)

3698 Emergency Toll Equipment. (1915)

3729 No. 22 Gauge Cable (Small Diameter Type).
(Replacing Specs. 3630)
(Replaced by Specs. 4130 (G. E. C. 1346))

3734 Instruction Governing the Use of Dynamite.

*3736 Locating Transpositions—Standard System.
(Replacing in part Specs. 3120 and 3146)
(Supplemented and Replaced in part by Specs. 3897)

3739 Specifications for Type "C" Porcelain Knobs.

3739 Specifications for Type "C" Porcelain Knobs, Amend. No. 1

3743 Dead Oil of Coal Tar or Coal Tar Creosote.
[fol. 15442] (Replacing Specs. 3340)

3744 Analysis of Dead Oil of Coal Tar or Coal Tar Creosote.
(Replacing Specs. 3339)

Memorandum Specifications Covering the Construction of Overhead Crossings of High Tension and Telephone Lines. Mar. 15, 1916.
(Replacing Specs. 3414)

3745 Specifications for Break Iron.
(Replacing Specs. 3224)

3746 5/8 Inch Steel Insulator Pins.

*3750 The Care and Operation of Storage Batteries.
(Replacing Bulletin 17, "Storage Batteries")

3751 Installation of New Type Break Irons and Old-Type Break Irons with Steel Pins at Loading Points.
(Supplementing Specs. 3258, 3265, 3278, 3291 and 3617)

3752 Installation of Old Type Break Irons Equipped with Steel Pins at Test and Terminal Poles.

3754 Standard Message Register Racks and Casings
(Replacing Specs. 3659 — Preliminary Draft)

3754 Standard Message Register Racks and Casings (Appendix No. 1).

3755 Local Test Desk No. 12.

3756 Local Test Desk No. 12—Description and Method of Operation.

3760 Master Specifications for Composite Cable (Non-Duplex).
(Replacing Specs. 3375)

3761 Specifications for Message Register Generators.
(Replacing Specs. 3633)
(Replaced by G. E. C. 1348—Bulletin #99)

3762 Specifications for Alternating-Current Induction Motors.
(Replacing Specs. 3511)

3763 Specifications for Repulsion—Induction Motors.
(Replacing Specs. 3512)

3767 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Three-Coil Unit (Coil Nos. 549 and 550, Case No. 26-B) and Lightning Arresters T-533-B for Circuits 5-6-15-16 and Corresponding Circuits on other Arms.

3768 (Confidential). Provisional Specifications for the Installation of Loading Coils on Open Wire Lines. Installation of Phantom Circuit Loading Coils No. 549 (Case No. 20-G) and Lightning Arresters T-533-B for the Following Circuits and Corresponding Circuits on Other Arms.

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1-2, 3-4
3-4, 5-6
5-6, 7-8
7-8, 9-10
5-6, 15-16

3769 Description of Central Office Equipment with Magneto Switchboard No. 105-A.
(Replacing Specs. 1820)

3770 Preliminary Specifications for the Construction of Toll Pole Lines.
(Replacing Specs. 2851, 2942 and 3269)
(Supplemented by G. E. C. 697)
(Replaced in Part by Spec. 3927)
(" " " " " 3928)

3770 Appendix A. Preliminary Specifications for the Construction of Twenty, Ten and Two-Wire Toll Pole Lines.
(Replacing Specs. 2851, 2942 and 3269)
(Supplemented by G. E. C. 697)
(Replaced in part by Spec. 3927)
(" " " " " 3928)

3771 Instructions for Making Insulating Joints in Lead-Covered Paper Insulated Cable.
(Replacing Specs. 2883)

3772 Main Frame Protection—"B" Type Frames

3773 " " " —"A" " "

**3774 Substation Protection—Including P.B.X.

3778 1212 Pair, No. 24 Gauge Cable.

3782 Dead Oil of Coal Tar for Brush and Open Tank Treatments.
(Replacing Specs. 3430)

3783 Liquid Grade Dead Oil of Coal Tar.

3787 Preliminary Specifications for Underground Cable Placing.

3788 Preliminary Specifications for Splicing Lead-Covered Paper Insulated Cables.
(Replacing Specs. 2385, 2494, 2576, 3170 and 3178)

3789 Specifications for Tinned Steel Sleeves.

3791 Duct Shields.
(Replacing Specs. 3218)

3794 Rubber Insulated Lead-Covered Cable.
(Replacing Specs. 3193)

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3795	Creosoted Rock Elm Insulator Pins. (Replacing Specs. 2528 and 2529)
3796	No. 19 B & S Gauge Duplex Cable.
3799	Ground Rods. (Replacing Specs. 1990 and 2375)
3800	No. 22 Gauge Cable (Aerial Type, Replacing Specs. No. 3356).
3801	No. 14 Gauge Hard-Drawn Copper Outside Distributing Wire. (Replacing Specs. 2849 and 3261)
3802	No. 17 Gauge Copper Steel Twisted Pair Outside Distributing Cable. (Replacing Specs. 3534)
3803	Bridle Wire (Replacing Specs. 3420).
3804	No. 14 Ground Wire.
3804	" " " " Amendment No. 1.
3805	Inside Wire. (Replacing Specs. 3047) (Amend. No. 2)
3805	Short Lengths of Inside Wire—Amendment No. 1
3816	Cable Racks and Hooks. (Replacing Specs. 3197 and 3198)
3817	Tinned Copper Sleeves for Cable Conductors. (Replacing Specs. 3399)
3818	Cotton Sleeving (Replacing Specs. 3299).
3818	Cotton Sleeving (Replacing Specs. 3299). Amend. No. 1.
3836	Standard Main Distributing Frames. (Replacing Specs. 3624)
3836	Standard Main Distributing Frames. (Replacing Specs. 3624) (Appendix No. 1)
3838	Douglas Fir Crossarms. (Replacing Specs. 3395)
3838	Douglas Fir Crossarms. (Replacing Specs. 3395) Amendment to Specs. 3838.
3841	Aerial Cable Safety Straps. (Replacing Specs. 3263)
*3850	Substation Protector Installation. (Replacing in part Specs. 2181) (Replaced by Specs. 4170)
*3851	Substation Apparatus.

[fol. 15445]

*3852 Substation Apparatus Installation.
(Replacing in Part Specs. 2181)

*3852 Substation Apparatus Installation.
(Replacing in part Specs. 2181) (Supplement "A").

*3853 Substation Wiring.
(Replacing in part Specs. 2181)

*3853 Substation Wiring.
(Replacing in part Specs. 2181) (Supplement A—G. E. C .#1235)

*3854 Substation Connections.
(Replacing in part Specs. 2181)

*3855 Adjustment of Substation Apparatus.

*3856 Substation Sign Installation.

*3857 No. 50 Coin Collector Installation.

*3857 No. 50 Coin Collector Installation—Supplement "A".

*3858 No. 50 Coin Collector Maintenance.

*3859 Substation Wiring Plans.

*3862 Telegraph Substation Installation.

*3862 Telegraph Substation Installation — Supplement "A".

3880 (Confidential). Preliminary Specifications for the Installation of "Building Out" Condensers on Open Wire Lines.
(Supplemented by Specs. 4024)

*3881 Main Frame Protection—"B" Type Frames.

*3882 Main Frame Protection—"A" Type Frames.

3883 Specifications for Double Tube Copper Sleeves.
(Replacing Specs. 2966)

3885 Creosoted Yellow Pine Poles.
(Replacing Specs. 3239)
(Replaced by Specs. 4209)

3886 Provisional Specifications for Adhesive Insulating Tape.
(Replacing Specs. 2962 and 3185)
(Replaced by Spec. 4183) (G. E. C. 1203)

3886 Amendment to Specification No. 3886—Adhesive Insulating Tape.

3892 Prov. Specs. for Vitrified Clay Sewer Pipe.

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*3897	Preliminary Specifications for Locating Telephone Circuit Transpositions. Exposed Line Transpositions System. (Supplementing and Replacing in Part Specs. 3736)
3899	Provisional Specifications for the Butt Treatment of Poles. (Replacing Specs. 2977)
3900	General Specifications for Equipments for United States Military Mobilization Camps—One Infantry Division.
3900	Appendix No. 1—General Specifications for Equipments for U. S. Military Mobilization Camps—One Infantry Division.
*3912	General Cable Splicing. (Replacing Specifications No. 3771 and in part Preliminary Specifications 3788)
*3912	General Cable Splicing—Supplement A Joints in conductors.
*3912	General Cable Splicing—Supplement B—Cable Transfer.
*3912	General Cable Splicing—Supplement C—Splicing Material for 24 Gauge Cable.
*3912	General Cable Splicing—Supplement D—Detecting Defective Pairs.
*3912	General Cable Splicing—Supplement E—Work in Machine Switching Lines.
*3912	General Cable Splicing—Supplement F—Lead Sleeves for 455 Pair 19 Ga. Cable.
*3913	Underground Cable Splicing. (Replacing in part Pre. Specs. 3788)
*3914	Aerial Cable Splicing. (Replacing in part Preliminary Specs. 3788)
*3914	Aerial Cable Splicing — Supplement "A"—Loading Coil Stub Cables.
*3915	Block Cable Splicing.
*3916	House Cable Splicing.
*3918	Substation Protection Including Private Branch Exchanges.
3920	Description of Central Office Equipment with Magneto Switchboard No. 105-B.

3921 Preliminary Specs. for the Construction of Wood Pole Lines used Jointly for Supply Circuits and Signal Circuits.
(Replacing Spec. 2651)

3923 Storage Batteries—chloride accumulator Type.
(Replacing Spec. No. 3697)

3925 Strand Connectors.

*3926 Pole Line Construction.
(Replacing Spec. No. 3211 and Amend. No. 1 to Spec. 3211)
(Replacing in part Spec. No's. 2877, 3235, 3770 and Appendix A to Specs. 3770)

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*3927 Guying.
(Replacing in part Specs. 2842, 2877, 3235, 3770 and Appendix A and 3929)

*3927 Guying—Supplement A—Guy Clamp—1 Bolt Clamp.

*3928 Open Wire Construction (G. E. C. 1134).
(Replacing in part Specs. 2842, 2877, 3235, 3639, 3770 and Appendix A to Spec. 3770)

*3929 Aerial Cable Construction.
(Replacing in part Spec. 3235)
(Replaced in part by Spec. 3927)

*3929 Aerial Cable Construction—Supplement A—24 Gauge Cable.

*3929 Aerial Cable Construction—Supplement B—455 Pair 19 gauge cable.

*3929 Aerial Cable Construction—Supplement C—Guy Clamp Attaching Braces for Multiple Spindle Loading Pots.

*3929 Aerial Cable Construction—Appendix 1—Use of B and C Cable Balconies with F.X. Terminals.

*3930 Drop Wiring.
(Replacing in part Specs. 3235)

*3930 Drop Wiring—Appendix 1—Multiple Fusing in Underground Cable Terminals.

*3931 Block Cable Construction.
(Replacing in part Specs. 3235)

*3931 Block Cable Construction—Supplement A—24 Gauge Cable.

*3931 Block Cable Construction—Supplement B—Guy Clamp—1 Bolt Clamp.

*3932 Block Wiring.
(Replacing in part 3235)

*3933 House Cable Placing.

*3933 House Cable Placing — Supplement A — 24 Gauge Cable.

*3933 House Cable Placing—Supplement B—Guy Clamp—1 Bolt Clamp.

*3935 New Designations for Wires and Sleeves.

3936 Douglas Fir Guard Arms.
Amendment No. 1 (See G. E. C. 1404)

3937 Creosoted Yellow Pine Guard Arm.
Amendment No. 1 (See G. E. C. 1404)

3943 Reinforcing Links.

3950 Guy Rods.

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3951 Guy Rods Integral to Patent Guy Anchors.

3952 Galvanized Wood Screws.

3955 Hand Magazine for Dynamite.
(Replacing Specs. 2244)

3956 Hand Magazine for Electric Blasting Cap.

3971 Wooden Pole Steps.
(Replacing Specs. 3152)

3971 Wooden Pole Steps—Amendment No. 1.

3972 Wooden Pole Brackets.

3973 Tree Blocks.
(Replacing Specs. 3195)

3974 Creosoted Pine Stubs.
(Replacing Specs. 3234)

3977 Eucalyptus Insulator Pins.

3978 2,200 Pound Strand.

3989 Provisional Specs. for Paraffin.

3998 Instructions for Using Correctness of Loading Testing Set in Installing Loading Coils.

4001 Standard Fuse Boards.
(Replacing Specs. 3661)

4003 Tin coating on Copper Wire.
(Replacing Specs. 3123)

4006 Specs. for Transposition Glass Insulators.
(Replacing in part Specs. 3001 and 3036)

*4009 Care of Trailer Axle Bearings.

*4010 Operation of Cable Reel Trailer.

4017 Second Grade Locust Pins.

*4018 First Aid.

4024 Installation of "Building-Out" Condensers on Open Wire Lines. Condensers Potted in No. 20-A Open Wire Loading Coil Case.
(Supplementing Specs. 3880)

*4032 Underground Cable Placing.
(Replacing Specs. 3787)

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*4032 Underground Cable Placing.
(Supplementing Spec. 4032)

*4033 Tree Pruning.
(Replacing Preliminary Specs. 4002 and G. E. C. 346)

4036 Thimbles.
(Replacing Specs. 3077)

*4039 Cable Terminating.

*4040 Jointly Used Wood Pole Lines Carrying Supply Circuits and Signal *Signal* Circuits.
(Replacing Specs. 3921)

4041 Porcelain Strain Insulators.
(Replacing Specs. 3097)
(Amend. No. 2 See G. E. C. 1816)

4048 Drive Screws.

*4054 Outside Plant Symbols.

4055 Reinforcing Strap.

4056 Distributing Frame Wire.
(Replacing Specs. 3007)

4056 Distributing Frame Wire—Amendment No. 1.

4063 No. 19 Gauge Cable 455 Pairs (BNB) Type.

*4064 Arrangements for obtaining simultaneous Telephone and Grounded Circuit Telegraph Operation.

*4065 Telegraph Circuits at No. 4 Morse Board and Test Board.

*Form E-268 Revised Dec. 22, 1922—List of Specs. included in Handbook of Central Office Telegraph Practice.

*4066 Bridge Polar Duplex Telegraph System.
(Replacing Specs. 3558)

*4067 Telegraph Power Supply.

*4068 Single Morse Telegraph System.

4069 Houseline.

4070 Body Belt and Safety Strap.
(Amendment No. 1 See G. E. C. 1327)

4074 Dowel Pin.
(Replacing Specs. 2971)

4075 B First Aid Box.
(Replaced by Spec. 4259)

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4076 B Cardboard Container.
(Replaced by Spec. 4254)

4077 C Cardboard Container.
(Replaced by Spec. 4254)

4078 4 in. Compress.
(Replaced by Spec. 4268)

4079 3 In. Compresses 2 Per Package.
(Replaced by Spec. 4267)

4080 1½ In. Compresses 6 Per Package.
(Replaced by Spec. 4266)

4081 Absorbent Gauze Compress.
(Replaced by Spec. 4269)

4082 Triangular Bandage.
(Replaced by Spec. 4273)

4083 6 In. Bandage.
(Replaced by Spec. 4272)

4084 Iodine Swabs 10 per Package.
(Replaced by Spec. 4274)

4085 Ammonia Inhalants 10 per Package.
(Replaced by Spec. 4275)

4086 Carbolated Petrolatum Tubes 6 Per Package
(Replaced by Spec. 4276)

4087 Tourniquet.
(Replaced by Spec. 4255)

4088 Wire Splint.
(Replaced by Spec. 4277)

4089 Spacer for B First Aid Box.
(Replaced by Dwg. #46-L-220 G. E. C. 1363)

4090 C First Aid Box.
(Replaced by Spec. 4260)

4091 D First Aid Box.
(Replaced by Spec. 4261)

4092 3 In. Compress 1 Per Package.
(Replaced by Spec. 4267)

4093 1½ In. Compress 1 Per Package.
(Replaced by Spec. 4266)

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4094 Iodine Swab 1 Per Package.
(Replaced by Spec. 4274)

4095 Ammonia Inhalant 1 Per Package.
(Replaced by Spec. 4275)

4096 Carbolated Petrolatum Tube 1 Per Package.
(Replaced by Spec. 4276)

4097 Cable Terminal Wire.
(Replacing Specs. 3450)

4099 Rock Guy Anchors.
(Replacing Specs. 3074 and 1721)

*4100 Preliminary Specification on Machine Switching Substations.
(Replaced by Spec. 4160)

4104 Creosoted Wood Conduit.
(Replacing Specs. 3352)

4105 Creosoted Plank.
(Replacing Specs. 3096)

4106 Sleeve Twisters.
(Replacing Specs. 2052)

4107 Steel Cable Crossarm.
(Replacing Specs. 3184)

4108 CL Tree Wire.
(Replacing Specs. 3237)

4109 WP Copper Wire.
(Replacing Specs. 3094)

4110 Bridle Rings.
(Replacing Specs. 3196)
(Amend. No. 1 See G. E. C. 1402)

4114 Exchange Insulators.
(Replacing Specs. 3343)

4115 Toll Insulators.
(Replacing Specs. 3276)

4116 D.P. Insulators. G. E. C. #1115 Transmits Revised Dwg. Issue #3 to Dwg. 46-L-20 "DP" Insulators.
(Replacing Specs. 3504)

4120 The Submersion Treatment of Poles.

4121 The Butt Treatment of Poles.
(Replacing Specs. 3899)

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4122 The Perforation Treatment of Poles.
(Replacing Specs. 3899)

4123 "NM" Cable (24 Ga.)

4124 "ANA" Cable (#22 Ga.)
4125 "ANB" Cable (#19 Ga.)
4126 Ground Rods.
(Replacing Specs. 3799)
4127 Muslin.
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4133 Strain Plates.
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4135 Copper Wire.
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4137 Tinned Steel Sleeves.
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Bulletin No. 84

American Telephone and Telegraph Company

Department of Development and Research

"22" Type Panel Mounted Telephone Repeaters

(Reading Type)

Confidential

Copy No. —

Approved J. J. Carty, Vice President

[fol. 15469] (Reprint)

Telephone Repeater Data

Section 6-E

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0. General.

0.1. Introduction.

The telephone repeaters and circuits described in the Notes accompanying G. E. C. No. 714 "Telephone Repeaters" were designed, primarily, for use on open wire lines and are not well adapted for offices where a large number of repeaters are employed. With the introduction of long toll cables requiring large repeater stations, it became necessary to develop means for decreasing the floor space required for the repeater equipment and to provide more

efficient methods for maintaining the repeater circuits. In order to do this the battery supply equipment and the jacks for testing and patching the repeater sets were dissociated from the repeater unit, which, together with the use of smaller coils, permitted two repeater circuits to be mounted on one floor type rack. The battery supply equipment together with the meter cord circuits for measuring the currents and voltages were located at a central meter panel while the jacks for testing and patching the repeater sets together with the testing equipment were located in a No. 4 toll test board section. This arrangement was employed in a few of the earlier cable offices.

In order to further simplify the repeater circuits for large installations a sectional unit mounting method adapted to the standard relay rack has been developed for telephone repeaters. With this arrangement the apparatus of the repeater set is assembled on a panel, capable of being mounted on vertical bays employing the standard relay rack spacings, drillings, etc. The jacks for testing and patching the repeater sets, the testing equipment, etc., are also assembled on panels which are mounted on the same [fol. 15475] bays with the repeater sets. The battery supply equipment is located separately as, in the case of the earlier cable offices, except that it is also arranged to mount on vertical bays employing the same dimensions as the standard relay rack and cordless meter circuits are employed as will be explained in Section 2.3. Arrangements have also been provided so that the filaments of two repeaters may be connected in series when desired.

0.2. Field of Use.

The relay rack repeaters described herein are designed primarily for use only on heavy or medium-heavy loaded cable circuits and no manufacturing information has been issued covering repeater sets arranged for medium loaded or non-loaded impedance. Also since a separate storage battery is invariably provided in cable type offices for supplying the space current, these repeaters are not arranged for use with a variable potential "B" battery. It is intended therefore that the repeaters described herein be used in general only in cable offices where a relatively large number of repeaters are required. They may be used however on open wire lines in certain cases, such as at the junction of

cable and open wire, or where a cable is soon to be placed, if there is appreciable economy in doing so.

1. Transmission Features.

1.1. General.

The transmission circuit of this panel mounted repeater is shown on Drawing No. 906-278. This set is made up with a single impedance of 1,800 ohms only. It is, in general, suitable only for use on heavy or medium-heavy loaded circuits. Further, the sets are adapted for use with constant potential 130-volt "B" battery only.

[fol. 15476] 1.2. Comparison with Unit Rack Floor Type Sets.

Comparison of this circuit with that of the unit rack floor type repeaters described in G. E. C. No. 714 and shown on Drawing No. 172-BX-40 will disclose the following differences.

1.21. High Frequency Filter.

The filter on the repeater per Drawing No. 906-278 is made up with three coils and two condensers instead of three coils and three condensers as in the old repeater. In the new repeater multi-section paper condensers have been employed for the capacities and a new mounting arrangement has been employed so that the bulk of the filter is materially reduced.

1.22. Potentiometer.

The panel type repeater has a low resistance potentiometer (900 ohms) connected on the low side of the input transformer instead of a high resistance potentiometer connected across the high windings of this coil. Because of its connection in the new location, a balanced potentiometer is required. However, on account of its low impedance, its size and cost have been materially reduced. This low resistance potentiometer has nine steps, the gain change produced by going from one step to an adjacent step being two miles. Drawing No. 906-1090 shows the resistance values of this potentiometer.

1.23. Input Transformer.

Input transformers of small dimensions have been substituted for the old type transformers which were very large.

The new transformer has an impedance ratio of 900 to 350,000 instead of 900 to 600,000 as in the former input coil.

[fol. 15477] 1.24. Condenser Shunt to Ground.

In the panel type set, a small condenser is connected between the midpoint of the potentiometer and ground. This serves to overcome the effect of the internal unbalance in the repeater set. This tends to improve the quality slightly, but its principal advantage lies in the fact that it permits the making of more reliable 21 tests. (The special 21 tests described in G. E. C. No. 891, "Telephone Repeaters—Improved 21 Circuit Test for Balance" are referred to here.)

1.25. Crosstalk Suppressors.

When the filament circuits of two repeaters are connected in series it is necessary to provide a means for reducing the crosstalk that results from the connection of the four tubes in series. By the use of the condensers connected across the filament of each tube, and connecting one side of the output transformer to the mid-point of these condensers the crosstalk is sufficiently reduced. (See bulletin No. 68).

1.26. Battery Supply.

On Drawing No. 906-1091 is shown a schematic diagram of the battery supply circuits with the filament circuits of two repeaters connected in series. Different values of resistance are required in the different "B" battery leads to maintain the same potential difference between the plate and filament of each tube since the potential of the filament to ground for each tube is 4.5 volts greater than the adjacent tube nearer ground.

[fol. 15478] 1.27. Signaling.

In the unit rack floor mounted repeaters the receiving signaling relays are connected across the bridge points of the output transformer. In order to improve the signaling, which is particularly essential when d. c. metallic telegraph is worked on the circuits, the relays for receiving the ringing current are bridged across the lines instead as shown on Drawing No. 906-278. In order to reduce the shunting effect of the repeater circuit on these relays, balanced 2-mf. condensers are inserted between the relay and the repeater. The principal effect which these condensers have on transmission is to reduce the efficiency of the repeater at low

frequencies. In order to preserve balance, a similar bridge, together with similar series condensers, are connected between the network terminals of the repeater and the balancing network.

When 135-cycle ringing is employed the balancing bridge includes a retardation coil and series condenser but the remainder of the ringing apparatus is not included. A shunt, resonant at 135 cycles, is also connected across the bridge points of the output transformer which reduces the gain of the repeater at 135 cycles an amount sufficient to prevent currents from circulating through the repeater and operating the 135-cycle relay on the wrong side of the repeater.

When 20-cycle ringing is employed, the balancing bridge consists simply of a cable pair the capacity of which is equal to the capacity of the pair connected to the line side of the repeater. Instead of connecting the end of this pair to a relay, as employed on the line side, it is left open, since the impedance of the relay is so high that its effect is negligible.

[fol. 15479] 1.3. Gain Characteristics.

When the potentiometer is on its top step the 1000-cycle gain is about 20.5 miles. For each step that the potentiometer is lowered the repeater gain is reduced two miles.

Drawing 906-283 shows typical gain frequency characteristics of this type of repeater. Three curves are shown, one with the potentiometer set on step 9 (top step), one with the potentiometer set on step 6 and one with the potentiometer set on step 3. It will be noted that the curve for step 6, which is about the average setting employed, is flatter than the curve for step 9.

The effect of the resonant shunt which, as previously mentioned, is employed in certain cases to improve the ringing, is indicated by a dotted curve for the condition when the potentiometer is set on step 9. It will be noted that the effect of the resonant shunt is to cause a reduction of the gain at low frequencies. The effect of this shunt does not vary materially with the setting of the potentiometer.

2. Description of Circuits and Equipment.

2.1. General Arrangement.

The general arrangement of the repeater equipment in offices where panel mounting is used is shown for a typical case on Drawing No. 192-B-11. With this arrange-

ment all the jacks for testing and patching the repeater sets, the testing equipment, a telephone set arranged for talking and monitoring on the repeater circuits, etc., are mounted on panels at the repeater rack along with the repeater sets in order to facilitate the maintenance of the circuits. The battery supply equipment for a large number of repeaters is grouped together on relay rack bays in general agree-
[fol. 15480] ment with the arrangement shown on Drawing No. 192-B-32. The balancing equipment, etc., is located on the composite coil racks in agreement with the present standard practice.

2.2. Repeaters and Associated Apparatus.

2.21. Repeater Sets.

The circuit of the repeater unit arranged for panel mounting is shown on Drawing No. 139-AX-30. This unit includes the apparatus necessary for the transmission circuit together with the local circuit relays necessary for transferring the signaling current around the repeater and the switching relays necessary for performing the proper functions when testing or when the attendant proceeds to talk or ring on the circuit. The signal receiving relays are located separately from the repeater unit so that either 20-cycle or 135-cycle ringing may be employed with only minor differences in the repeater unit. It will be noted that the circuit has been simplified somewhat by cutting out some of the features such as the "21" circuit test relays, means for monitoring east and west, and for operating relays in the repeater circuit which cut the repeater out when making gain measurements, etc., which were provided in the old standard repeater circuits but which are not required in connection with panel mounted installations used on cable circuits.

The apparatus of the repeater set is assembled on a panel as shown on Drawing No. 187-BX-5.

2.22. Line Circuits.

A typical arrangement of a through two-wire phantom group at a cable type telephone repeater station is shown in schematic form on Drawing No. 140-A-98. It will be noted on this drawing that jacks are provided at the primary test
[fol. 15481] board to permit testing the lines and for patching between the line circuits and the equipment as a whole

in case of line trouble, and at the repeater rack for testing and patching the repeater sets in case of repeater trouble. For cable installations it is not considered that the amount of trouble on equipment such as composite sets and phantom repeating coils will be sufficient to warrant the provision of jacks either at the test board or repeater rack to permit patching these units separately.

Repeater jack circuits are provided for each repeater set as shown on Drawing No. 191-B-100. The line and repeater line jacks are intended for patching between the lines and repeater sets. Network and repeater network jacks are also provided for patching the network circuit in case a repeater is used temporarily on a line which requires a network different from that which is normally associated with it. The provision of these jacks also facilitates making the balance tests mentioned in Section 3.5. Monitoring jacks are also provided for each repeater set. These jacks are wired as shown on Drawing No. 192-B-1.

The repeater set jacks and monitoring jacks together with the trunk jacks and other miscellaneous jacks, are located in a jack panel at the repeater rack as shown on Drawing No. 199-B-19. One jack panel is provided for each bay which should have sufficient capacity to care for the jacks of all the repeaters located within that bay.

2.3. Battery Supply Arrangements.

2.31. Power Supply.

In offices where a large number of telephone repeaters are employed, the labor involved in keeping the filament current constant is excessive unless means are provided so that fre-
[fol. 15482] quent adjustments in the individual filament circuits are not required. This may be done by splitting the central office battery and arranging the power plant equipment so that it is not necessary to charge either section of the battery while it is in use. A routine may then be followed under which it will be possible to regulate the battery voltage closely enough so that the variations in the filament current will not exceed the allowable limits. An automatic filament current regulating circuit is available for use in offices where close regulation of the battery voltage is not provided for.

Duplicate 130-volt batteries should be provided for supplying the space current since the repeaters described

herein are not arranged so that they can be used with a battery while it is being charged.

2.32. Battery Supply Circuits.

As it is expected that one of the above methods of controlling the filament current will be employed in offices where cable type repeaters are used, no means have been provided for inserting a rheostat in the filament circuits. Instead, small No. 18 and No. 19 type resistances are provided which are adjusted at the time of installation to compensate for differences in the resistance of the wiring in different circuits so as to obtain the proper filament current. After these resistances are once adjusted it will not be necessary to change them except to compensate for variations in the resistance of different vacuum tubes. Such adjustments will be necessary only when the resistance of the new tube is considerably above or below its normal value and will seldom be required.

[fol. 15483] The No. 101-D vacuum tubes described in Bulletin No. 68 "Nos. 101-D and 102-D Vacuum Tubes in Telephone Repeaters" operate on a lower filament current than the No. 101-B tubes which they replace. This, together with their slightly lower resistance makes it possible to operate four tubes in series from the 24-volt central office battery, which effects a very considerable saving in power consumption, especially in offices having a relatively large number of telephone repeaters.

The battery supply circuit for use where four tubes are operated in series is arranged as shown on Drawing No. 144-A-100. A key is provided in the filament circuit and in each of the plate circuits for measuring the currents. A battery cut off key is also provided for opening the filament circuit at times when the repeaters are not in operation. The alarm lamp for indicating an open filament is mounted in the base of key of the battery supply circuit with which it is associated.

The use of four tubes with their filaments in series requires that some care be taken in laying out the repeater equipment so as to prevent introducing unnecessary resistance in the wiring and cabling of the filament circuit and in no case should this resistance be allowed to exceed one ohm. In offices where duplicate batteries are not provided and where the voltage drops to 20 volts at the fuse board while the battery is being discharged, it may be necessary in a few

cases to select the tubes to be connected in series in order to prevent the current from dropping below the minimum during periods of low voltage. If duplicate batteries are pro- [fol. 15484] vided or if the battery voltage is always maintained above 21.0 volts at the fuse board selection of tubes should not be necessary in any case, provided the wiring resistance does not exceed one ohm.

In order to reduce the filament circuit resistance as much as possible, the windings of the No. 71-B retardation coil are connected in parallel and the filament alarm is obtained by means of a relay in the plate circuit of one of the tubes, instead of providing a relay in series with the filaments as was previously the practice.

In some special cases it may be desirable to connect only two tubes in series. In such cases the battery supply circuit is arranged as shown on Drawing No. 199-B-10.

In order to facilitate maintenance, the battery supply equipment is dissociated from the repeater sets and the apparatus for a large number of circuits located at a central point in general agreement with the arrangement shown on Drawing No. 192-B-32. A mounting plate as shown on Drawing No. 192-B-8 is provided for mounting the keys, one mounting plate caring for the keys of 10 battery supply circuits. The keys should be located at such a height as to be convenient to reach and so that it will be possible to read the meters when operating any of the keys.

2.33 Meter Circuits.

The voltmeter, ammeter and milammeter circuits provided for measuring the various currents and potentials are arranged as shown on Drawing No. 191-B-99. The ammeter and milammeter are wired to keys in the filament circuits and plate circuits so that the operation of a key associated with a given circuit connects the proper meter in series. [fol. 15485]. The "A" and "B" battery voltages are measured across the busbars instead of providing means for an individual measurement for each repeater set. The rheostat in series with the ammeter is for the purpose of adjusting the filament current when making tests for defective tubes.

It will be noted on Drawing No. 191-B-99 that apparatus may also be provided for adjusting the plate voltage to 130 volts when making tests on the vacuum tubes. This equipment will not ordinarily be required in cable type repeater

offices and may be omitted where the "B" battery voltage does not vary beyond the limits 125 volts to 135 volts, or wherever a repeater gain set is used for making these tests.

The meters are assembled on a panel as shown on Drawing No. 192-B-7. One set of meters should be provided for each three bays of battery supply equipment, the meters being located in the central bay about five feet above the floor. In offices where more than three bays are required for the battery supply equipment, it will be necessary to provide an additional set of meters.

Where both "22" type and four-wire repeaters are installed in the same office the same set of meters may be used for the two-wire and four-wire battery supply circuits. The two types of battery supply circuit may also be installed in the same bay if it is desirable to do so in order not to require the installation of an additional relay rack bay or an additional set of meters.

It is evident that any appreciable resistance in the ammeter leads will result in an incorrect measurement of the filament current. For this reason the resistance in the leads from the ammeter to the individual ammeter keys should not be allowed to exceed .12 ohm.

[fol. 15486] 2.34 Automatic Filament Current Regulating Circuit.

In offices where it is not economical or desirable to install duplicate 24-volt batteries the automatic filament current regulating circuit shown on Drawing No. 144-A-23 and described in Bulletin No. 65 "Automatic Filament Current Regulating Circuit," may be provided. With this arrangement the filament current can be kept within the required limits over the usual range of voltage of the 24-volt battery. Only one circuit of this kind need be provided in each office as it is capable of caring for about 400 filament circuits.

When the automatic filament current regulating circuit is used in offices where the battery supply equipment is located at a central point, the apparatus is located at the relay rack along with the rest of the battery supply equipment in general agreement with the arrangement shown on Drawing No. 196-B-30.

2.35 Alarm Circuits.

A no-voltage alarm circuit as shown on Drawing No. 185-B-79 should be provided in all offices where vacuum tube

repeaters are installed in order to provide an audible signal in case of failure of the telephone repeater "B" battery.

The auxiliary signal circuit for use in connection with the filament alarm is arranged as shown on Drawing No. 191-B-98.

2.4 Balancing Equipment.

The balancing equipment for use with cable type repeaters should be in accordance with the present standards. Drawings are attached covering the arrangement of the balancing equipment ordinarily required in cable offices. [fol. 15487] Drawing No. 144-A-30 covers the arrangement of the repeating coil groups employing balanced coils for use with "22" type repeaters. These coils are located at the composite coil rack as shown on Drawing No. 187-BX-90. In case phantom balancing sets (No. 51-A resistance) are required in the phantom circuit networks for balancing the non-inductive resistance in the side circuit repeating coils they should be connected between the drop windings of the repeating coil in the phantom circuit as indicated on Drawing No. 192-BX-5.

Where the two-wire circuits are composited for d. c. metallic telegraph, metallic composite balancing sets as shown on Drawing No. 193-B-99 are required. This equipment is located at the composite coil rack as shown on Drawing No. 196-B-57.

In cases where open wire lines enter the cable office and composite balancing sets are required for them the arrangements shown on Drawings Nos. 176-BX-3 or 180-BX-72 should be employed. The composite balancing equipment for open wire lines is located at the coil rack as shown on Drawing No. 172-BX-32.

The basic networks and building out sections are located at the coil rack in general agreement with the arrangement indicated in Fig. 1, Drawing No. 142-A-65.

In cable offices where jacks are not provided in the line circuit for the individual equipment units such as composite sets and phantom repeating coils, it is not considered necessary to provide jacks for the corresponding balancing equipment in the network circuits of the through line repeaters. In such cases the network circuits may be set up as indicated on Drawing No. 192-BX-6. Where jacks are desired for patching the individual equipment units in the

[fol. 15488] network circuit, the arrangement shown on Drawing No. 176-BX-1 may be used.

2.5 Testing Equipment.

2.51 Testing Circuits.

Either the 2-A repeater gain set described in Bulletin No. 27 which accompanied G. E. C. No. 1160-"A-" repeater Gain Set—Bulletin No. 27" or the receiver shunt circuit shown on Drawing No. 186-BX-99 may be used for testing repeater gains. The receiver shunt circuit is terminated in jacks at the repeater jack panel which are patched to the repeater line jacks east and west when it is desired to test the repeater circuit. The testing circuit jacks should be multipled in each relay rack repeater bay. This circuit is used in the same way as the testing circuit provided with the old standard repeaters except that when the repeater cutout key is thrown no relays are operated on the repeater set, the necessary switching functions being done by relays in the testing circuit. The testing circuit is assembled on a mounting plate as shown on Drawing No. 192-B-9.

2.52 Telephone Set.

The telephone set provided to permit talking and monitoring on the repeater circuit is arranged as shown on Drawing No. 192-B-2. This circuit is terminated on jacks in the repeater jack panel which are patched to the monitoring jacks of the repeater when it is desired to talk, monitor or ring on the repeater set. The telephone set jacks should appear in all of the repeater bays which the telephone set is intended to care for.

[fol. 15489] The telephone set together with the apparatus for the local ringdown trunk circuit mentioned below is assembled on a panel as shown on Drawing No. 192-B-10. In general, one telephone set should be provided for each three repeater bays.

2.53 Local Trunks.

Apparatus is provided with each telephone set for one local ringdown trunk circuit to the testboard. This circuit is arranged as shown on Drawing No. 192-B-3.

2.54 Interposition Trunks.

Interposition trunks are provided between the testboard and the repeater bays as shown on Drawing No. 192-B-4 to

permit patching between the testboard and repeater when desired. Where a full complement of interposition trunks is provided one-half of them should be multipled in the even numbered repeater bays and one-half in the odd numbered bays. The jacks at the repeater rack are located in the repeater jack panel shown on Drawing No. 199-B-19.

2.55 Miscellaneous Jacks.

Space for a number of miscellaneous jacks is provided in each of the repeater jack panels for miscellaneous circuits or for terminating spare networks or other miscellaneous equipment as required. Apparatus or circuits may be wired to these jacks as local conditions require.

2.6 Signaling Equipment.

The 20-cycle and 135-cycle signaling relay circuits associated with the repeaters are located separately from the repeater set and are wired as shown on Drawing No. 193-B-82. It will be noted that where 135-cycle signaling is employed the 135-cycle signal receiving circuit is connected [fol. 15490] across the line side of the output transformer and is balanced by a similar bridge across the network terminals. Also a shunt, resonant at 135-cycles, is connected across the bridge points of the output transformer in order to introduce a large loss in the repeater at 135-cycles and thus prevent false operation of the No. 150-Type relays where relatively large gains are required.

Where 20-cycle ringing is employed no relay is provided for balancing the No. 196-A relay, but a balancing cable pair equal in length to the relay leads should be provided in the same cable and left open at the position of the No. 196-A relay.

Two signaling relay circuits are required for each through line repeater. Two resonant shunts are required for each repeater arranged for 135-cycle ringing.

Where available the 135-cycle motor generator set should be used for supplying the signaling current to 135-cycle through line repeaters. The arrangement of the 135-cycle signaling leads for either 135-cycle generators or interrupters is shown on Drawing No. 187-B-4.

2.7 Cabling.

The cabling between the terminal strips at the top of the repeater bays and the distributing frame consists of

No. 19 gauge double silk and double cotton insulated lead covered cable. In general one cable is provided for each bay for the line and network circuits. Battery and generator leads are carried in a cable separate from the talking conductors in order to avoid noise induction.

[fol. 15491] The battery supply circuits should be cabled directly from the fuse board to the battery supply bay and then to the repeater set in order to avoid introducing unnecessary resistance in the filament circuit. No. 19 gauge conductors should be used for the "B" battery and signaling leads and No. 16 gauge conductors for the "A" battery leads. In order to permit connecting four tubes in series the total wiring resistance in the filament leads should be kept as low as practicable and in any case should not be allowed to exceed one ohm.

The local cables between the terminal strips at the top of the battery supply bays and the apparatus within the bay consists of a factory made form employing #20 B. B. E. wire for all conductors except the ammeter leads. The leads from the ammeter to the individual ammeter keys should be large enough so that the total resistance to the farthest key does not exceed .12 ohm.

3. Maintenance and Testing Requirements.

3.1. Precautions Against Magnetizing Coils.

Certain transformers and coils used in telephone repeater circuits are liable to be permanently injured in case direct current is allowed to flow through them. For this reason no source of direct current should be used in connection with a voltmeter, Wheatstone bridge, buzzer, or receiver in testing the repeater circuits. When it is necessary to trace out connections in the repeater wiring an alternating current of 800 or 1000 cycles should always be used and the tests made by bridging a receiver in series with a condenser across the circuit. A condenser should always be used in series with the receiver in order to prevent any pos-[fol. 15492] sibility of direct current being connected to the coils through the receiver.

An exception to the above is the test for continuity in the high winding of the input transformer which is required when the repeater is in trouble and the input transformer is suspected. In order to make this test, a portable voltmeter should be connected across terminals 1 and 3

of the repeater socket. A reading somewhat lower than the "C" battery potential should be obtained which will indicate the continuity of the input transformer winding. The high resistance of the voltmeter and transformer winding limits the direct current to a safe value.

3.2. Current and Potential Measurements.

The values of the filament current and plate potential are given in Bulletin No. 68 "—Use of Nos. 101-D and 102-D Vacuum Tubes in Telephone Repeaters". The normal space current is 8 mils. The filament current may be measured by operating the ammeter key, which connects the ammeter in series with the circuit. The plate voltage may be measured by operating the non-locking key B on the meter panel provided for that purpose. The space current may be measured by operating the mil-ammeter key in the battery supply circuit. When the key is thrown to the left the space current in the "east" tube is measured and when thrown to the right the current in the "west" tube is measured.

The normal value of the grid potential is 9 volts. The grid potential is measured by connecting a portable volt- [fol. 15493] meter across the terminals of the "C" battery. The "C" battery potential should not be allowed to drop below 8 volts.

3.3. Gain Tests.

As mentioned in division 1.3 above the normal gain for step 9 of the potentiometer when measured at 1000 cycles is 20.5 miles. With normal vacuum tubes, the gain should not deviate more than + 1 or — 2 miles from this unless the repeater is in trouble.

As the potentiometer setting is reduced the 1000-cycle gain should be reduced 2 ± 0.25 miles per step. The gain frequency characteristic of a normal repeater should not deviate more than ± 1 mile from the curves shown on Drawing 906-283 referred to in division 1.3 above. In making comparison of measured results on repeaters with the standard characteristics shown on the drawing, the gain at 1000 cycles should be made the standard of reference, comparisons being made in all cases of the differences between the gain at other frequencies and the gain at 1000 cycles. For example, in the case of the curve shown on Drawing 906-283 for step 6, the gain at 1700 cycles is 1.1

mile less than the 1000 cycle gain. For a repeater under test the 1700-cycle gain should fall between the limits 1.1 ± 1 mile from the 1000-cycle gain.

In order to insure successful operation it is very desirable that all repeaters of this type be fully checked up with respect to gain characteristics when the repeater is first installed and at such intervals as may be specified in standard instructions. For checking up the gain frequency [fol. 15494] characteristics it is usually sufficient to employ five frequencies only. For this type of repeater the frequencies suggested are 200, 500, 1000, 1700 and 2000 cycles.

In order to check up the condition of a repeater by means of single frequency measurements as above, the No. 2-A repeater gain sets as described in Bulletin No. 27, which accompanies G.E.C. No. 1160, will be found very suitable. The receiver shunt circuit shown on Drawing No. 186-BX-99 is not accurate enough for this purpose.

For very rough work it may sometimes be desired to use the receiver shunt circuit shown on Drawing No. 186-BX-99. The procedure for measuring the gain of a repeater with this receiver shunt circuit is as follows:

Patch the East "testing circuit jacks" to the "repeater line jacks east" and the West "testing circuit jacks" to the "repeater line jacks west" using three conductor cords. This causes relays in the repeater circuit to operate over the sleeve conductors of the patching cords, thus connecting test networks comprised of resistances to the repeater set in place of the regular networks.

Next set the potentiometer in the direction of transmission to the normal position with the potentiometer in the other direction at step zero.

The tone key is then thrown in the direction it is desired to test and the receiver shunt is adjusted until the same tone is heard with the repeater cutout key in either position.

The reading on the receiver shunt then indicates the gain of the repeater circuit. This reading cannot ordinarily be relied upon closer than ± 2 miles.

To test the repeater in the opposite direction the potentiomete settings should be reversed and the tone key thrown in the opposite direction.

[fol. 15495] 3.4. Tests on Vacuum Tubes.

Since the efficiency of vacuum tubes decreases after they have been in use for sometime it is necessary to make tests

at periodic intervals in order to insure that they are functioning properly and in order that tubes which are becoming defective may be replaced before they actually develop trouble in service. The method of making these tests with a No. 2-A Repeater Gain Set is described in Bulletin No. 27 which accompanied G.E.C. No. 1160.

Where a No. 2-A Repeater Gain Set is not available the tubes may be tested by means of the apparatus provided at the meter panel for this purpose. To make this test at the meter panel the ammeter key of the repeater circuit under test is operated and the current adjusted by means of the rheostat to the values specified. The space current is then measured by operating the mil-ammeter key. The condition of the tube is indicated by the variation in the space current for a given change in the filament current. The requirements which No. 101-D tubes should meet are set forth in Bulletin No. 68.

3.5. Balance Tests.

In order to insure proper operation of the repeater circuit it is necessary that the internal unbalances in the repeater be low. The improved "21" circuit No. 1 described in G.E.C. No. 891 "Telephone Repeaters—Improved 21 Circuit Test for Balance" provides a quick and simple means for determining the condition of balance. (Using method No. 1 it should be remembered that the true singing point is six miles greater than that indicated by the sum of the potentiometer settings.) When the "21" test [fol. 15496] is applied to two equal 1800 ohm resistances, the internal unbalances in a normal repeater of this type should be so low that a singing point of at least 40 miles will be indicated.

References:

G. E. C. No. 714	"Telephone Repeaters."
G. E. C. No. 891	"Telephone Repeaters,—Improved 21 Circuit Test for Balance."
G. E. C. No 1160	"No. 2-A Repeater Gain Set—Bulletin No. 27."
G. E. C. No. 1237	"Telephone Repeaters—Nos. 101-D and 102-D Vacuum Tubes."
Bulletin No. 65	"Automatic Filament Current Regulating Circuit."

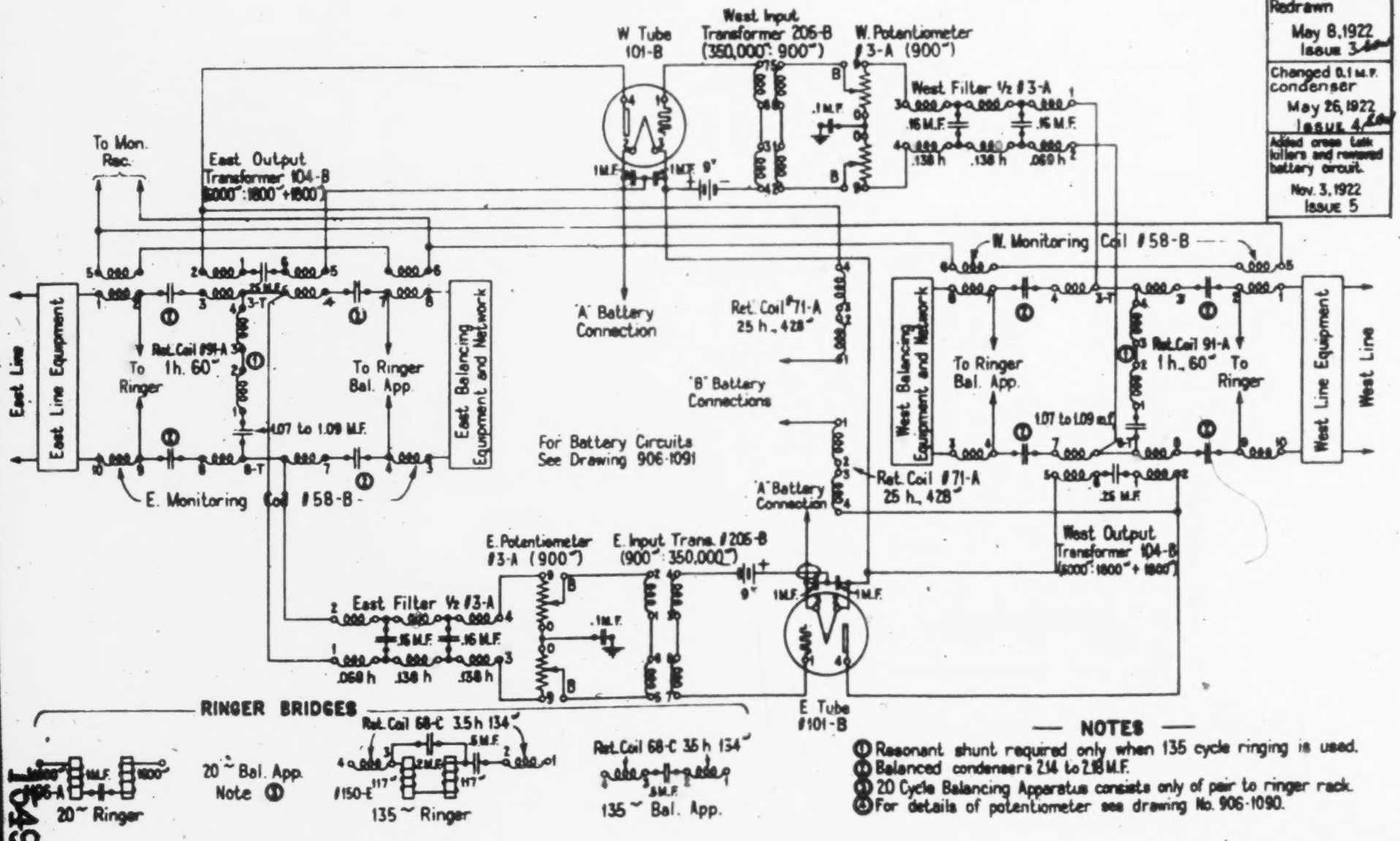
A.T.&T.CO. Dept. of Dev. & Res.

TRANSMISSION FEATURES OF READING TYPE

22 Type Telephone Repeater Circuit

906-278

Engineer
Draftsman
Checked by H.S.H.
Redrawn May 8, 1922 Issue 3
Changed 0.1 M.F. condenser May 26, 1922 Issue 4
Added cross talk killers and restored battery circuit. Nov. 3, 1922 Issue 5



NOTES

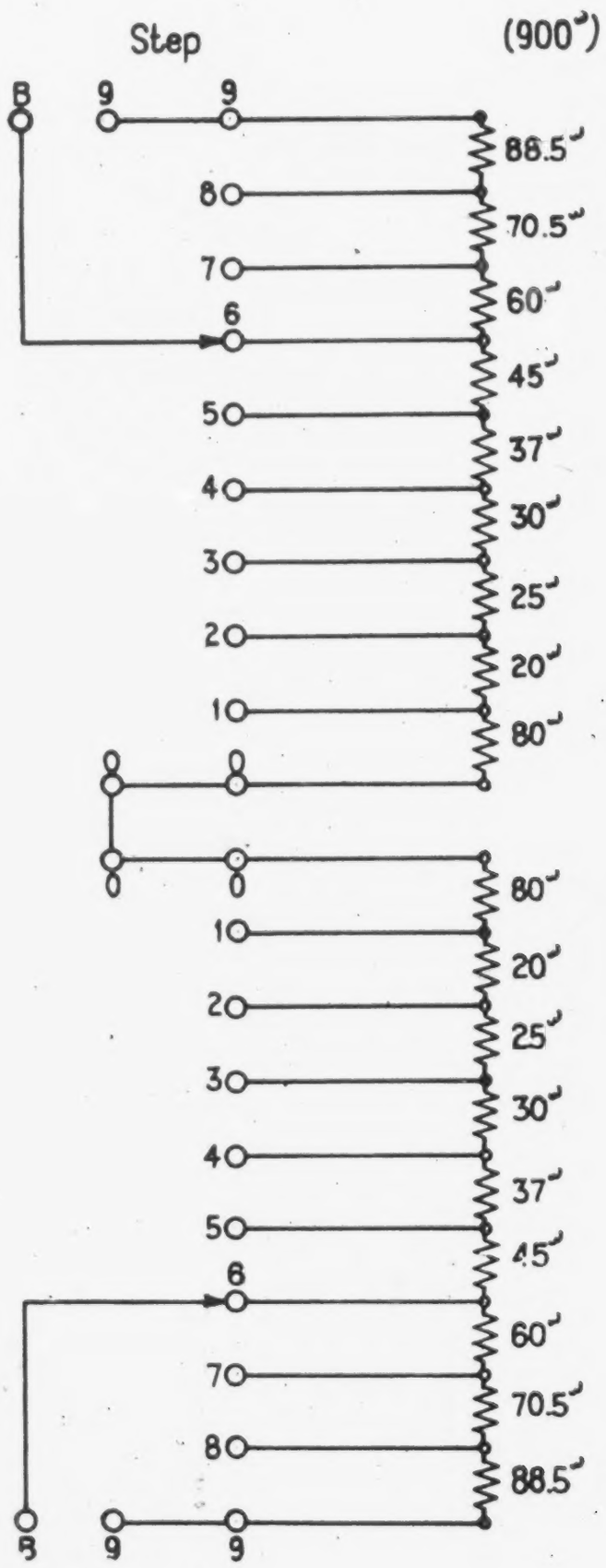
(1) Resonant shunt required only when 135 cycle ringing is used.
(2) Balanced condensers 2.14 to 2.18 M.F.
(3) 20 Cycle Balancing Apparatus consists only of pair to ringer rack.
(4) For details of potentiometer see drawing No. 906-1090.

10497

A.T.&T.CO.
Dept. of
Dev. & Res.

Diagram of #3-A Potentiometer for Reading Type Repeater

906-1090
Nov. 3, 1922



Resistances should be within ± 2% of nominal values.

15498

A.T.&T. CO
Dept. of
Dev. and Res.

TRANSMISSION DIAGRAM OF BATTERY SUPPLY
CIRCUITS FOR READING TYPE TELEPHONE REPEATER

908-1091

Engineer Legal
Draftsmen
Checked by

Nov. 3, 1922
Issue 1

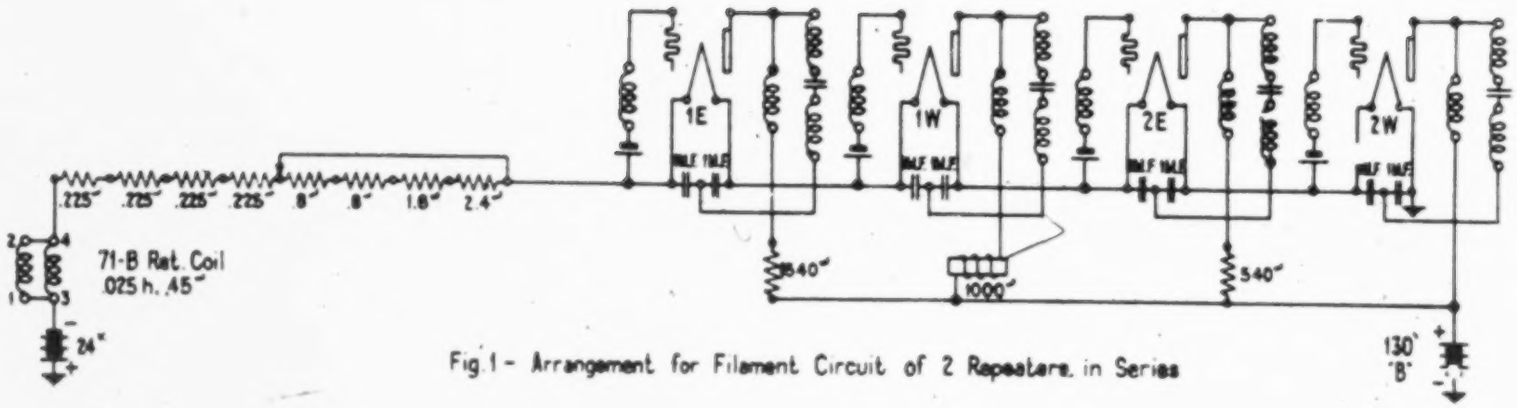


Fig. 1 - Arrangement for Filament Circuit of 2 Repeaters in Series

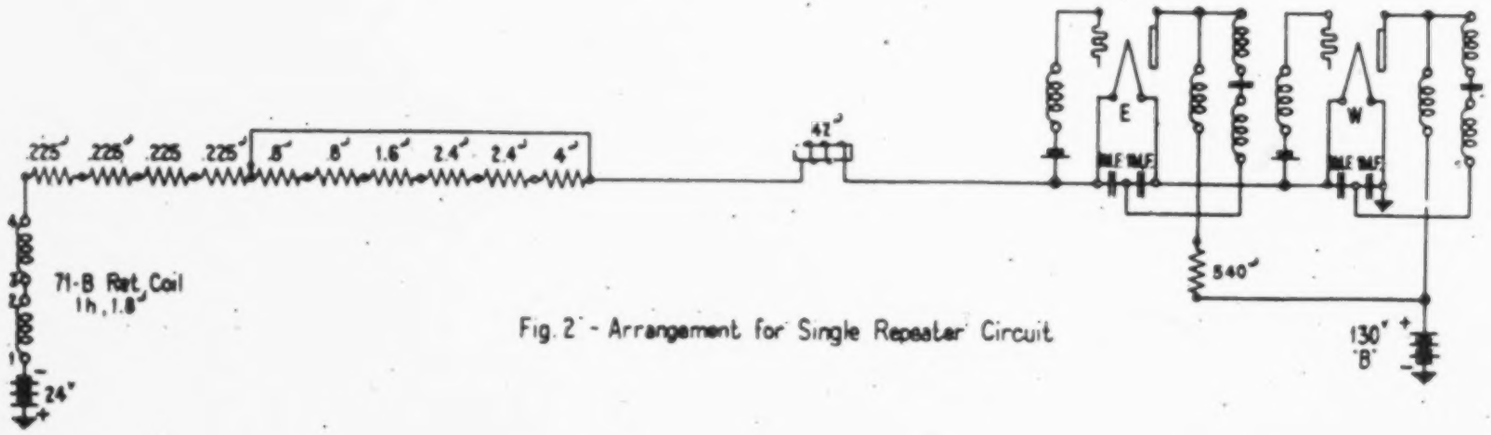
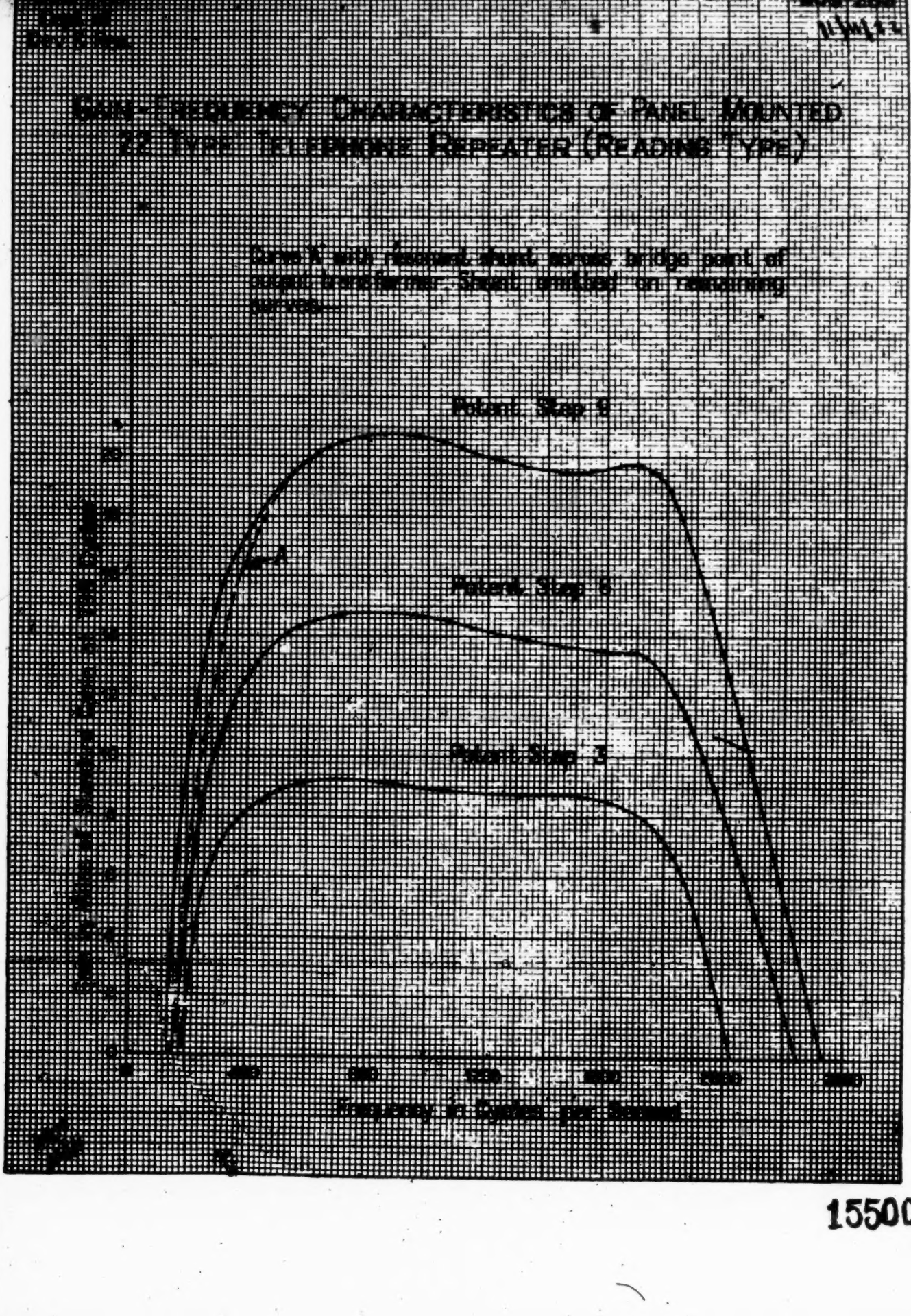


Fig. 2 - Arrangement for Single Repeater Circuit

15499


Drive A with resistance shunt across bridge point of output transformer. Shunt omitted on receiving set.
Point Step 9
Point Step 6
Point Step 3
Frequency in Cycles per Second

15500

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
"22" TYPE THROUGH LINE REPEATER
(Reading Type)
Arranged for 20-Cycle or 135-Cycle Ringing
Arranged for Relay Rack Mounting

Repeating Coil #58 B
E

To #150 E Relay for 135 Cycle Ringing
To #196 A Relay for 20 Cycle Ringing
See Drawing No 193 B 82 Fig 1 or 2

To Repeater Jack Circuit See Drawing No 191 B 100

#122 C F

2 MF H
#57 O
To 135~ Resonant Shunt for 135~ Ringing See 193-B-82 Fig 3

2 MF G
#57 O

Output Transformer #104 B
E

#57 O
2 MF E

½ #3 A High Freq Filter

#57 D
.1 MF

#3-A Potentiometer E

Input Transformer #205 BE

#57 B
1 MF

#100 A Socket

C Batt

#101-D Vacuum Tube.

Spl #12 D 129

3 #18 AE
Test Network

Note ①
#149 T or #149 per D 14161
A

#122 BD

#122 AM

#122 CF
D

Balancing pair to be wired through #196-A Relay Jack Box and left open at position of #196-A Relay for 20 cycle ringing. Cross connect to 150-E Relay balancing bridge for 135 Cycle ringing. See Dwg No 193-B-82 Fig 2

Battery Supply for all relays

#71 A

To Monitoring Jacks See Dwg No 192-3-1

#122 CB

#18 AF

#122 CF
A

#149 T or #149 per D 14161
B
Note ①

See Note ①

To 28~ or 135 ringing supply See Dwg No 187 B 4
Note ②

To Repeater Jack Circuit See Drawing No 191-B-100

To #196 A Relay for 20 Cycle Ringing
To #150 E Relay for 135 Cycle Ringing See Dwg No 193-B-82 Fig 1 or 2

#122 CF
C

#122 IF

C 2 MF

To 135~ Resonant Shunt for 135~ Ringing See 193-B-82 Fig 3

Output Transformer #104-B
W

#57 O
D 2 MF F

#57 U
A
2 MF

B

½ #3-A High Frequency Filter

#3-A Potentiometer W

Low
High
#57 C

#100 A Socket

C Batt

Input Transformer #205 B W

#101-D Vacuum Tube

Test Network
3 #18 AE

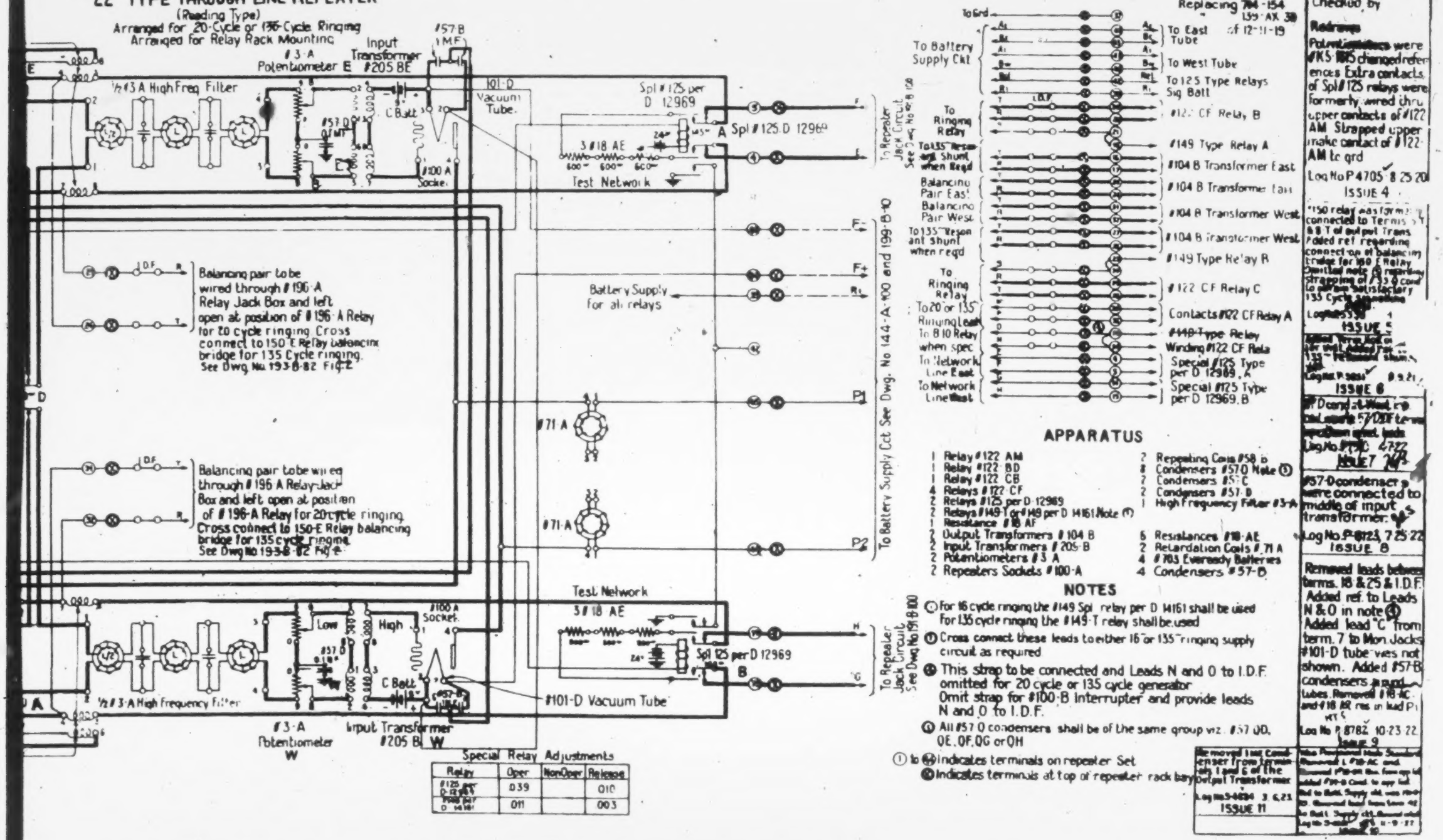
Repeating Coil #58-B
W

Special Relay Adjustments

Relay	Oper	Non-Oper	Release
#122 CF D	.039		.010
#149 T or D 14161	.011		.003

TELEPHONE REPEATER EQUIPMENT
"22" TYPE THROUGH LINE REPEATER

(Reading Type)
Arranged for 20-Cycle or 135-Cycle Ringing
Arranged for Relay Rack Mounting



Special Relay Adjustments

Relay	Oper	Non Oper	Release
#125 per D-12969	039		010
#149 per D-14161	011		003

139-AX-30
Standard
Replacing 704-154
139-AX-30

APPARATUS

1	Relay #122 AM	2	Repeating Coils #58 B
1	Relay #122 BD	8	Condensers #57 D Note (3)
1	Relay #122 CB	2	Condensers #57 C
4	Relays #122 CF	2	Condensers #57 B
2	Relays #125 per D-12969	1	High Frequency Filter #3-A
2	Relays #149-T or #149 per D 14161 Note (1)		
1	Resistance #18 AF		
2	Output Transformers #104 B	6	Resistances #18 AE
2	Input Transformers #205 B	2	Retardation Coils #71 A
2	Potentiometers #3 A	4	#763 Eveready Batteries
2	Repeaters Sockets #100 A	4	Condensers #57 D

NOTES

(1) For 16 cycle ringing the #149 Spl relay per D 14161 shall be used
For 135 cycle ringing the #149-T relay shall be used

(2) Cross connect these leads to either 16 or 135 ringing supply circuit as required

(3) This strap to be connected and Leads N and O to I.D.F. omitted for 20 cycle or 135 cycle generator
Omit strap for #100-B Interrupter and provide leads N and O to I.D.F.

(4) All #57 O condensers shall be of the same group viz. #57 OD, OE, OF, OG or OH

① to ⑯ Indicates terminals on repeater Set
Ⓐ to Ⓗ Indicates terminals at top of repeater rack bay

Engineer
Draftsman
Checked by

Redraws

Potentiometers were #K5-1805 changed references Extra contacts of Spl #125 relays were formerly wired thru upper contacts of #122 AM Strapped upper make contact of #122 AM to grd

Log No P 4705 8 25 20
ISSUE 4

#150 relay was formerly connected to Terminals 5 & 8 T of output Trans. Added ref regarding connection of balancing bridge for 150 E Relay Omitted note (3) regarding strapping of #135 O cond to obtain satisfactory 135 Cycle operation

Log No 5358 1
ISSUE 5

Log No P 5851 8 9 21
ISSUE 6

Log No P 6723 7 25 22
ISSUE 8

Removed leads between terms. 18 & 25 & I.D.F. Added ref to Leads N & O in note (3) Added lead "C" from term. 7 to Mon Jacks #101-D tube was not shown. Added #57-B condensers around tubes. Removed #18 AC and #18 BE res in lead P1

Log No P 8782 10-23 22
ISSUE 9

Removed lead Condenser from terminals 1 and 6 of the Output Transformer

Log No 5-0836 3 6 23
ISSUE 11

15501

TELEPHONE REPEATER EQUIPMENT

Through Two Wire Phantom Group
Arranged for Metallic Morse
Schematic Diagram

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

Basic Network
B.O Section
Composite Set
Composite Balancing Set
Phantom Composite Balancing Set
IDF
IMF
Repeating Coil
Line Jacks East
Repeater Line Jacks East
Net Jacks East
Rep Net Jacks East
Rep Line Jacks East
Rep Net Jacks West
Net Jacks West
Repeater Line Jacks West
Line Jacks West
Rep Line Jacks West
"22" Type Repeater
Line #1 East
Line #2 East
100Ω
#218
To Metallic Morse Line Jack or to Morse By-Pass cord
Primary Test Board
East Cable
Two Wire Repeater Rack

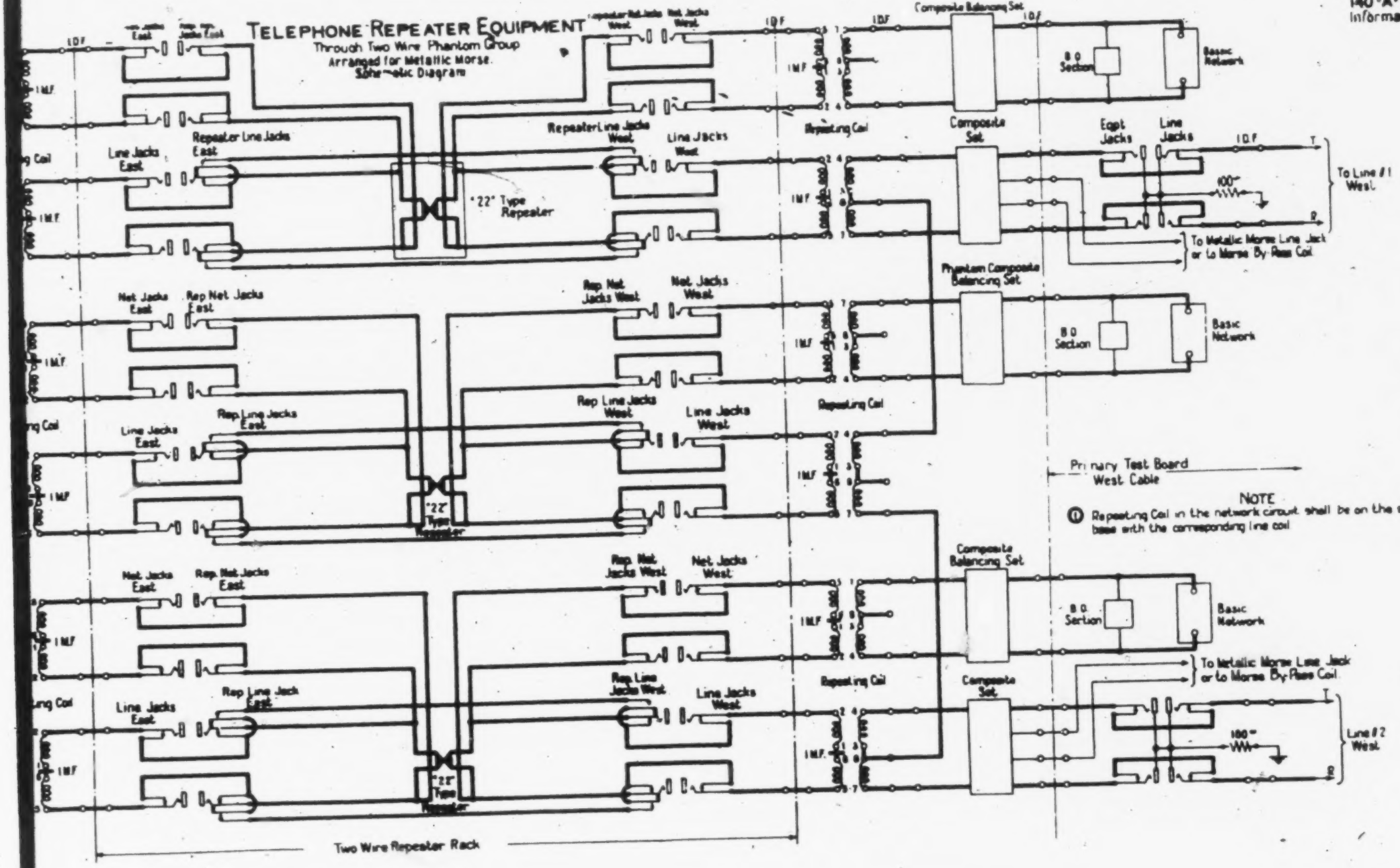
140-A-98
Information

Engineer Dr. Warren
Checked by
Log No P-705 8 5 20
Issue 1

Added Note
Log No 17591 [illegible]
[illegible]
Condensers in drop sides of coil were not shown.
Log No P-8827 11-1-22
ISSUE 3

TELEPHONE REPEATER EQUIPMENT

Through Two Wire Phantom Group
Arranged for Metallic Morse.
Schematic Diagram



TELEPHONE REPEATER EQUIPMENT

Automatic Filament Current Regulating Circuit

For Use in 24 Volt Offices

H6-A-23
Standard
Replacing 155-B-22

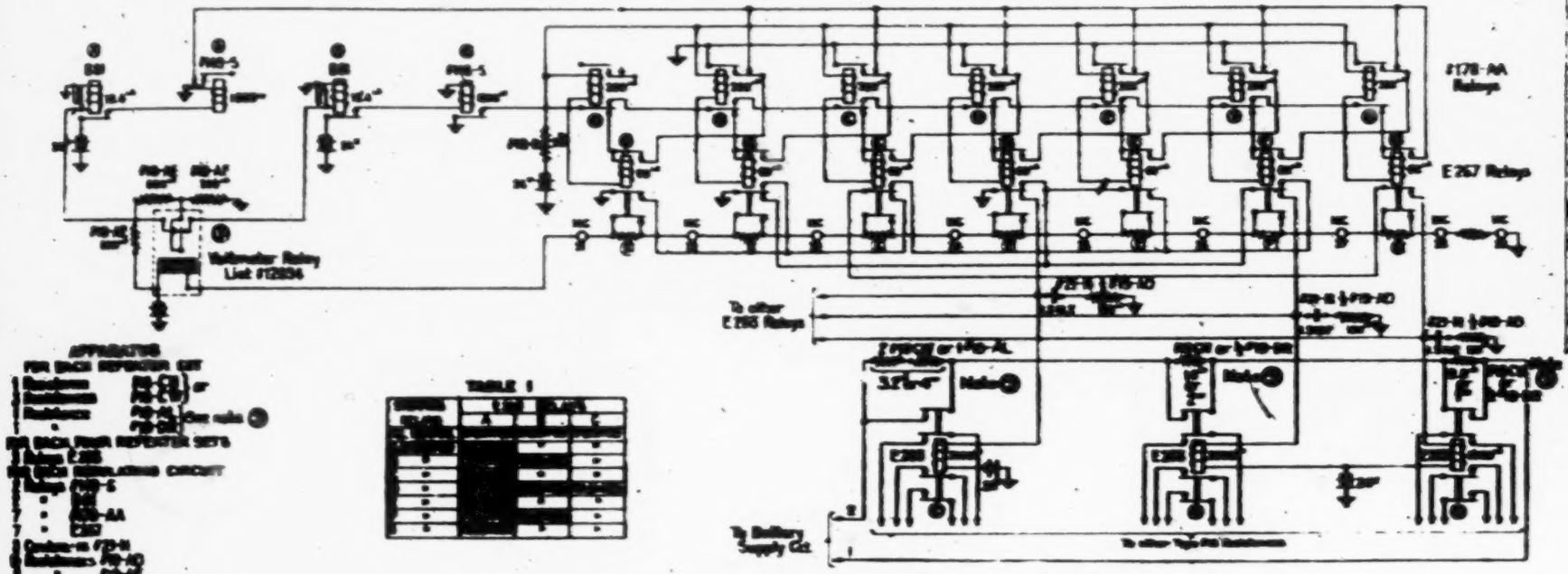


TABLE 1

-NOTES-

There shall be 3 leads each equipped with a 1 Ampere fuse from the 24-volt battery. One of these leads shall supply the voltmeter relay, one the master relays and one the E 265 relays.

Multiplier Resistance, furnished with voltmeter Relay F12834.
Increasing voltage moves the voltmeter relay pointer to right. Decreasing voltage moves the voltmeter relay pointer to left. All relays now shown in position for maximum voltage.

In offices where the filament current is maintained between the leads L2 and L3 inclusive the P19-CW and P19-CW resistances shall be used. In offices where the filament current is maintained between the leads S4 and S8 inclusive the P19-BW and P19-AL resistances shall be used.

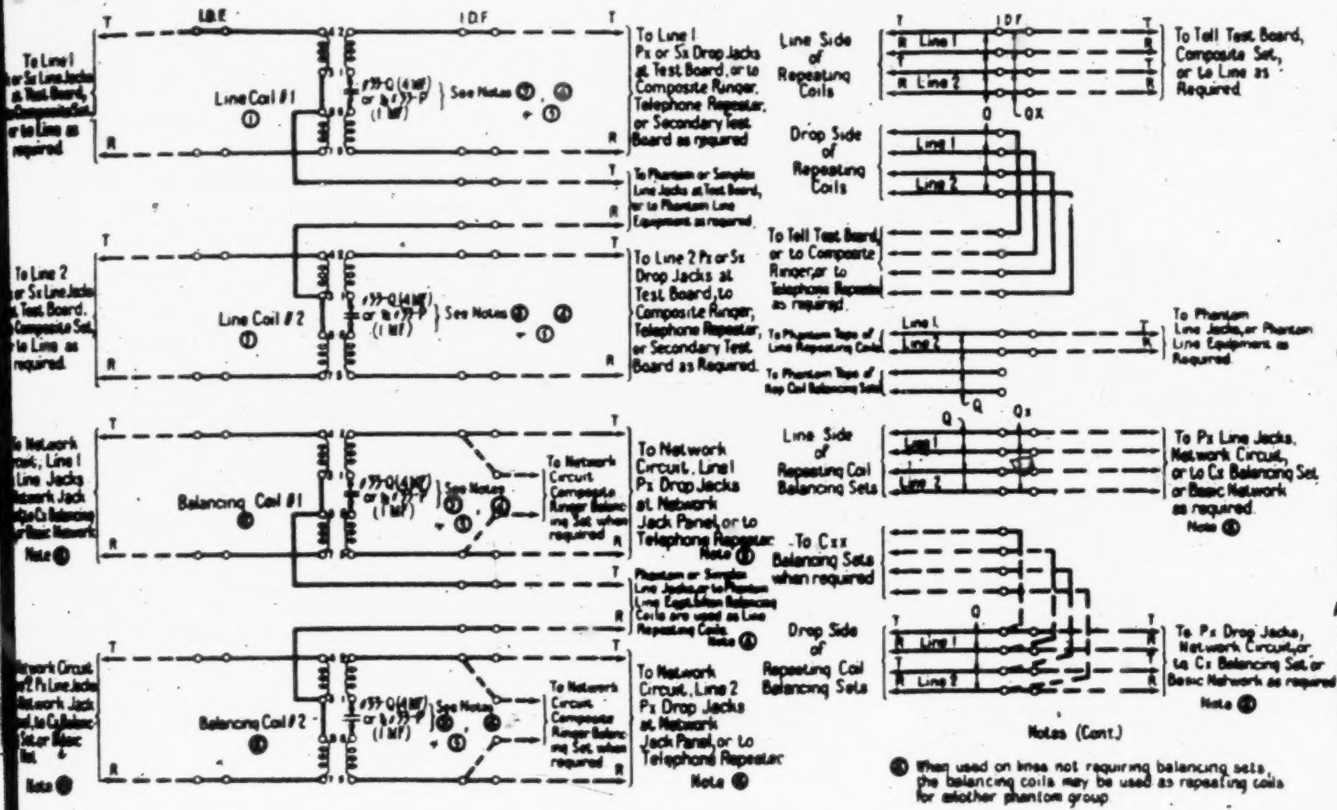
AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

REPEATING COIL GROUP

Employing Balanced Coils For use with Telephone Repeaters

144-A-30
Standard
Replacing ITE-BX-4



Notes (Cont.)

⑤ When used on lines not requiring balancing sets, the balancing coils may be used as repeating coils for another phantom group

- NOTES -

① Repeating Coils shall be as specified. The line coils shall be mounted on the same base with its balancing coil in the network circuit. The types of coils used are as shown in table I.

② Pairs marked "Q" in the cabling diagram are in duplex cable and pairs marked "Qx" are in duplex distributing frame wire. Each pair marked "Q" or "Qx" shall be in the same quad with the pair with which it would form a phantom.

③ Where repeating coil does not form shunt preventing proper operation of direct current supervisory relays in cords or trunks, the condensers shall be omitted except on circuits equipped with DC metallic telegraph.

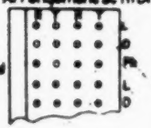
④ When repeating coils are used on small gauge cable circuits equipped for DC metallic telegraph, ½ #39 P (1 MF) condensers shall be used in all other cases where condensers are needed #39-Q (4 MF) condx. shall be used.

⑤ The same type of condenser shall be used in the line circuit and in the network. When 4 MF are required (see Note ④) the condenser shall preferably be #39-QD #39-QE, #39-QL or #39-QH, but #39-Q may be used.

TABLE I

COIL NO	IMPEDANCE RATIO			RESISTANCE	
75-A	1	TO	1	22Ω	21Ω
75-B	1	TO	1.62	14Ω	21Ω
75-C	1.62	TO	1	22Ω	13Ω
75-D	1	TO	2.62	8.5Ω	22Ω
75-E	2.62	TO	1	22Ω	8.5Ω

Terminal Strip Arrangement at HIDF



APPARATUS

2 Repeating Coils per Note ①
4 Condensers #39-Q or
2 Condensers #39-P per Notes ③ and ④

Engineer [illegible]
Draftsmen
Checked by
Log No. P 1545-4-7-22
ISSUE 1

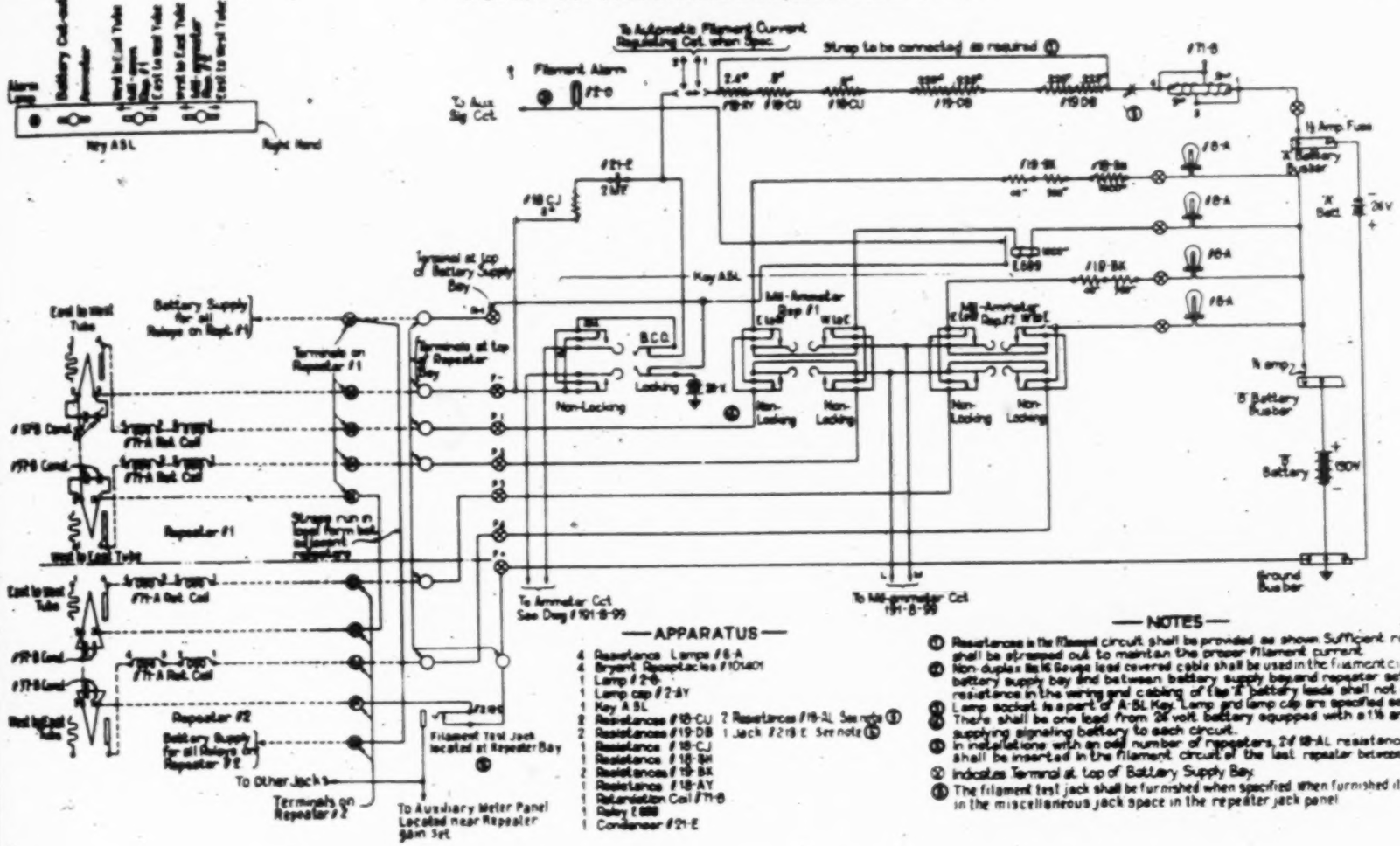
New Prov. Made, Stat. Replacing [illegible]
#39-P Cond. specified instead of #39-Q when 1 MF required. Changed order of notes and added note ⑤
Log No. 9-12896, 6-21-22
ISSUE 2

Log No. 5446h, 12-15-22
ISSUE 3

15504

Telephone Repeater Equipment
Battery Supply Circuit
For Reading Type 2-Wire Telephone Repeaters
For Offices where the Filament Circuits of 2 Repeaters are Connected in Series

144-A-100
Superseding
Replacing 1104 BICT
Partly Replacing 191-8-93



—APPARATUS—

4	Resistance Lamps #6-A
4	Bryant Receptacles #1014101
1	Lamp #2-B
1	Lamp cap #2-AY
1	Key A-BL
2	Resistances #18-CU 2 Resistances #19-BL See note (11)
2	Resistances #19-DB 1 Jack #2218-E See note (13)
1	Resistance #18-CJ
1	Resistance #18-BH
2	Resistances #19-BK
1	Resistance #18-AY
1	Retardation Coil #71-B
1	Relay #688
1	Condenser #21-E

—NOTES—

(1) Resistances in the filament circuit shall be provided as shown. Sufficient resistance shall be stranped out to maintain the proper filament current.
(2) Non-duplex No 16 Gauge lead covered cable shall be used in the filament circuit between the fuse board & the battery supply bay and between battery supply bay and repeater set. The total resistance in the wiring and cabling of the 'A' battery leads shall not exceed 1.0 Ohm
(3) Lamp socket is a part of A-BL Key. Lamp and lamp cap are specified separately
(4) There shall be one lead from 26 volt battery equipped with a 1½ ampere fuse for supplying signaling battery to each circuit.
(11) In installations with an odd number of repeaters, 2 of 18-AL resistances (4" each) shall be inserted in the filament circuit of the last repeater between the #19-DB Res. and #71-B Coil
(12) Indicates Terminal at top of Battery Supply Bay.
(13) The filament test jack shall be furnished when specified. When furnished it shall be located in the miscellaneous jack space in the repeater jack panel

Issue 1
Issue 2
Issue 3
Issue 4

15505

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

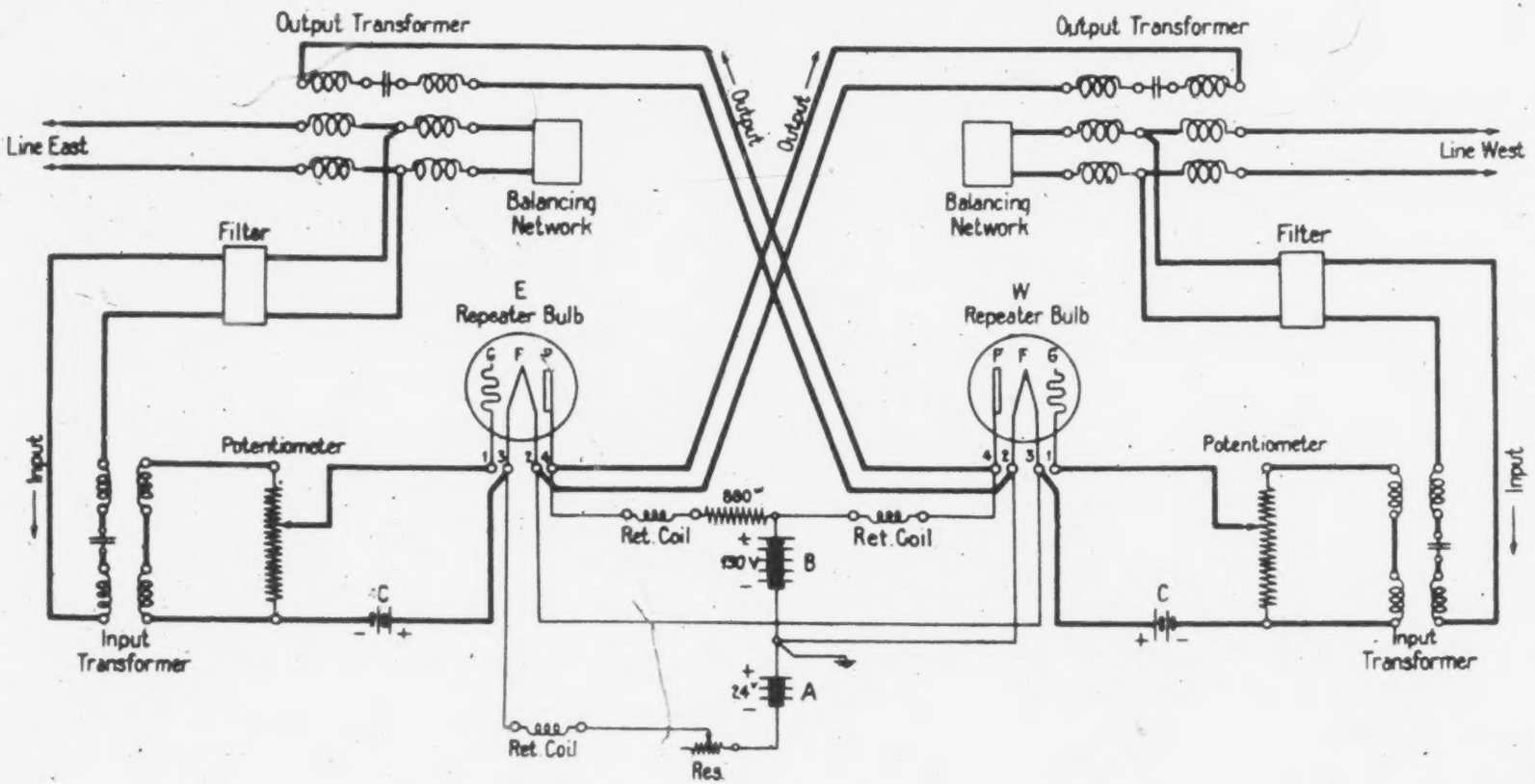
TELEPHONE REPEATER EQUIPMENT

Simplified Diagram of a "22" Type Telephone Repeater Circuit for Vacuum Tube Repeaters.

172-B-40
Standard
Replacing 172-BX-40
of Oct. 17, 1919.

Engineer
Draftsman
Checked by
Redrawn.
Log No. S-1881. 3-22-20
ISSUE 7

Title Changed.
Log No. S-4301 11-16-22
ISSUE 8



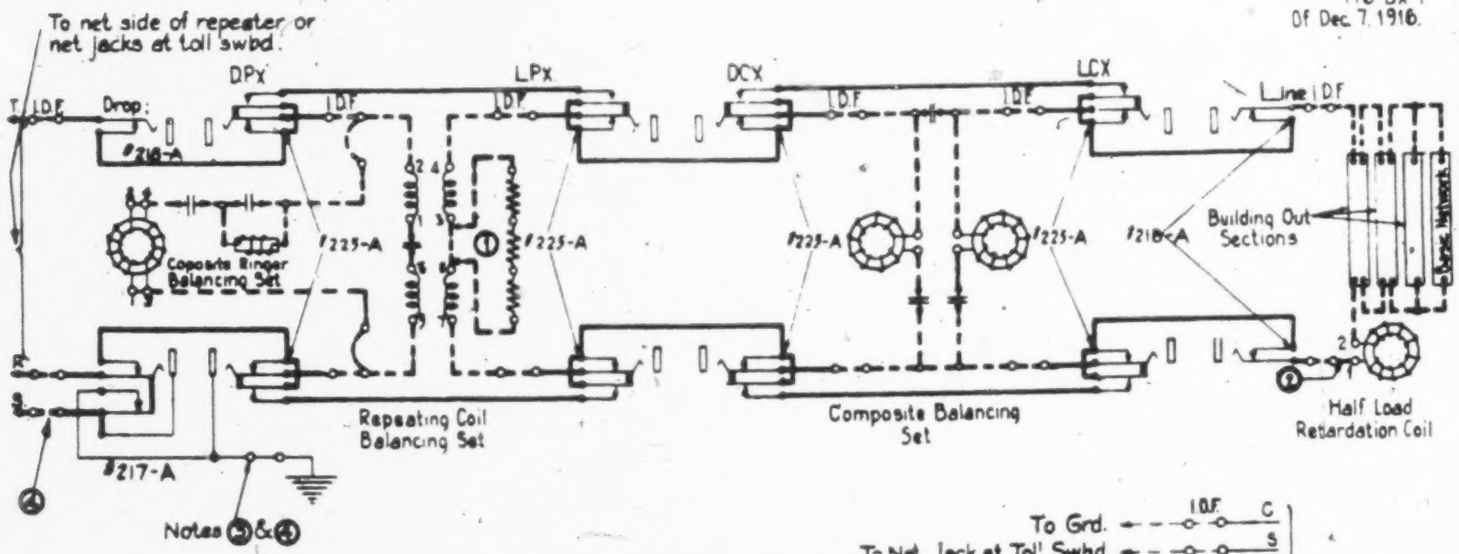
15506

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
NETWORK JACK CIRCUIT

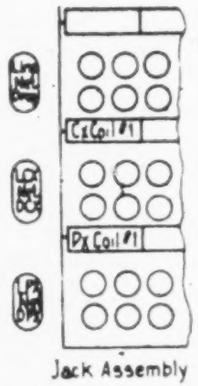
176-B-1
Standard
Replacing 128-A-30
128-A-31
133-A-31
176-BX-1
Of Dec. 7, 1916.

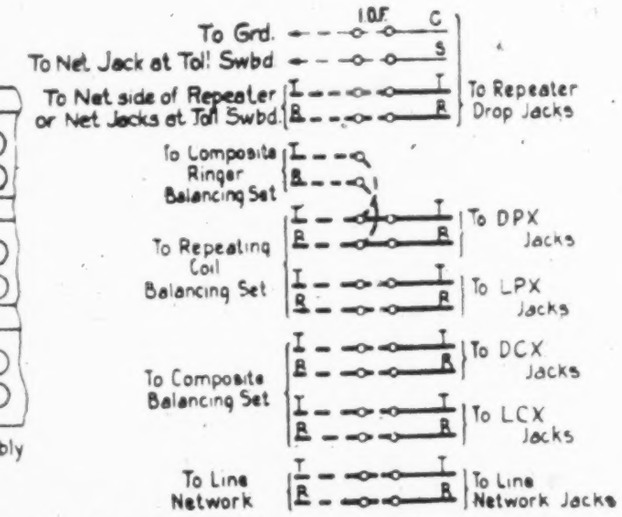
Engineer	M.L.C.
Draftsman	
Checked by	
Redrawn	
Log No. S-3538	5.5.22
ISSUE 3	
Added Notes ① and ⑤	
Log No. S-3609	6.16.22
ISSUE 4	
Changed jack designations, added notes 3, 4 and 5. Used #217-A jack instead of #218-A jack.	
Log No. S-4114	9.26.22
ISSUE 5	



-Apparatus-

3 Jacks #218-A
8 Jacks #225-A
④ 1 Jack #217-A





—NOTES—

The Composite Ringer Balancing Set, Repeating Coil Balancing Set, Composite Balancing Set, Building out Sections, Basic Network and Half Load Retardation Coil shall be furnished as specified

① When this network is used to balance a phantom circuit with composited side circuits which requires a resistance for balancing the resistance of the repeating coils on the side circuits, the #51-A resistance shall be connected between terminals 3 and 8 of the repeating coil balancing set.

② When this net work circuit is used to balance a composited phantom circuit which requires a resistance for balancing the resistance of the repeating coils on the side circuits, the #51-A resistance shall be connected in series with the line network.

⑤ The sleeve lead shall be connected to ground as shown for those lines which are not equipped with composite ringers or which require composite ringer balancing sets different from those associated with the cord circuit repeater.

④ In offices where cord circuit repeaters are not used or where relays are not provided in the network sleeve of the cord circuit repeater, the sleeve leads to the repeater drop and DPX jacks may be omitted and a #218-A jack used instead of a #217-A jack.

⑤ The cabling from the I.D.F. to the jacks should approximate in length that of the line cables of the test board.

15507

American Telephone & Telegraph Co.
Department of
Development & Research

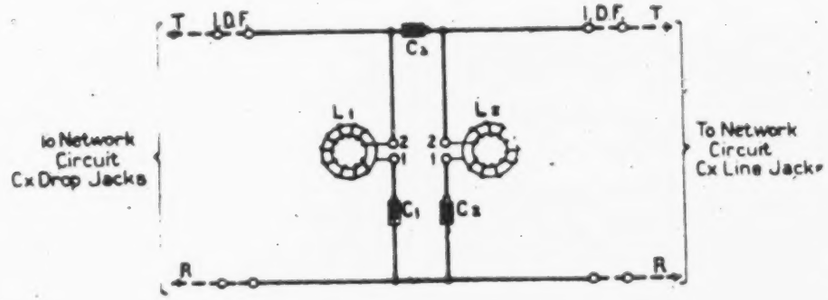
TELEPHONE REPEATER EQUIPMENT
COMPOSITE BALANCING SET.

176-B -3
Standard

ISSUE 2
Added D-Spec Application
Mod. Right and Dec 3, 1946

ISSUE 3
Res of #44-H was 175
" #44-G " 75
Log No 17716 7-26-17

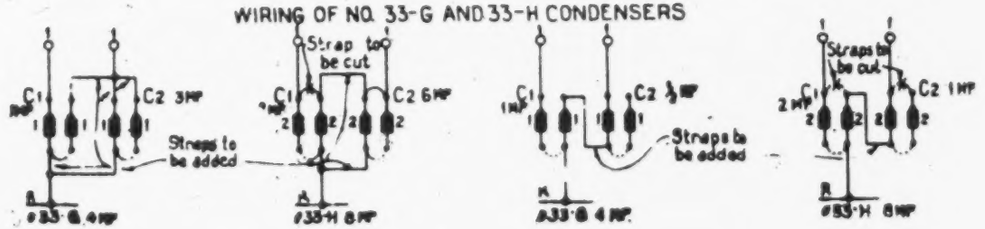
ISSUE 4



—APPARATUS—

	TERMINATING PHYSICA OR PHANTOM LINES COMPOSITED.	TERMINATING PHANTOM LINES WITH SIDE CIRCUITS COMPOSITED	TERMINATING PHYSICAL OR PHANTOM LINES WITH INTERMEDIATE COMPOSITES	TERMINATING PHANTOMS WITH INTERMEDIATE COMPOSITES ON SIDE CIRCUITS.
Coils	L1 285 ~ / L2 285 ~ } #44-H	L1 115 ~ / L2 115 ~ } #44-G	L1 285 ~ / L2 285 ~ } #44-H	L1 115 ~ / L2 115 ~ } #44-G
Condensers	C1 1 MF. / C2 3 MF. } #33-G	C1 2 MF. / C2 6 MF. } #33-H	C1 1 MF. / C2 ½ MF. } #33-G	C1 2 MF. / C2 1 MF. } #33-H
	C3 1 MF. #33 per D-10454.	C3 2 MF. #33 per D-10460	C3 1 MF. #33 per D-10454	C3 2 MF. #33 per D-10460

WIRING OF NO. 33-G AND 33-H CONDENSERS



15508

American Telephone & Telegraph Co
Department of
Development & Research

TELEPHONE REPEATER EQUIPMENT
COMPOSITE BALANCING SET.

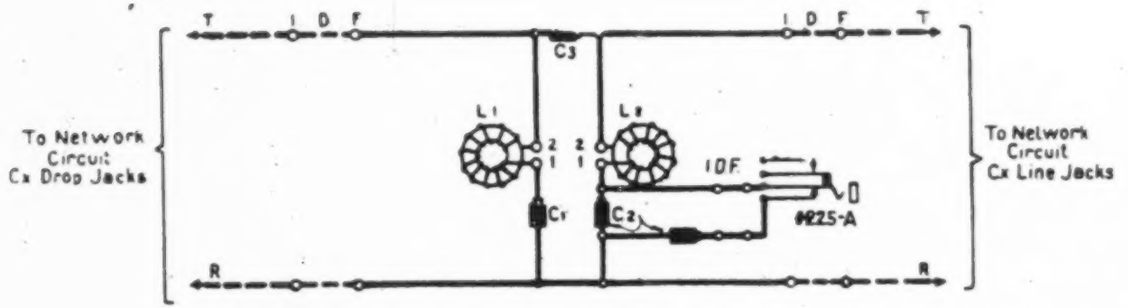
Arranged to change from terminal to intermediate or from intermediate to Terminal balancing set

180-B-72
Standard

Engineer [illegible]
Draftsman [illegible]
Checked by [illegible]
Made Standard 1-3-[illegible]
Log No. 7353 6-25-[illegible]

Issued [illegible]
Wire standard [illegible] to leads to Jack [illegible] notes regarding [illegible] ing the sets [illegible]
Logged 190.78 Jan 3 1918

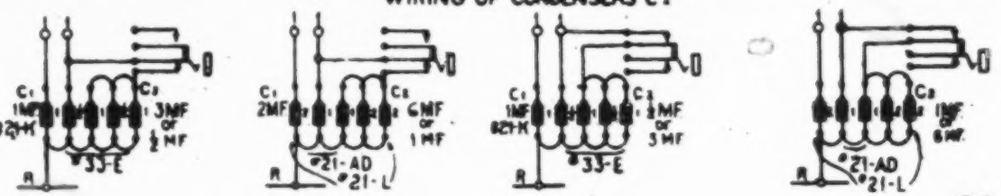
ISSUE 2 3-[illegible]
#225-A Jack [illegible] #215
Log No. S-4053. [illegible] 14-22
ISSUE 3



APPARATUS

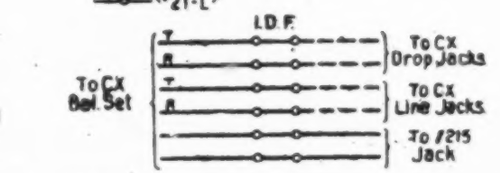
	Normally Terminal Set Convert to Intermediate		Normally Intermediate Set Convert to Terminal	
	TERMINATING PHYSICAL OR PHANTOM LINES COMPOSITED	TERMINATING PHANTOMS LINES WITH SIDE CIRCUITS COMPOSITED.	TERMINATING PHYSICAL OR PHANTOM LINES WITH INTERMEDIATE COMPOSITES	TERMINATING PHANTOMS WITH INTERMEDIATE COMPOSITES ON SIDE CIRCUITS.
Coils	L1 285 ~ L2 285 ~ 1 #44-H	L1 118 ~ L2 118 ~ 1 #44-G	L1 285 ~ L2 285 ~ 1 #44-H	L1 118 ~ L2 118 ~ 1 #44-G
Condensers	C1 1MF 1 #21-K; C2 3MF 1 #33-E	C1 2MF 1 #21-AD; C2 6MF 3 #21-L	C1 1MF 1 #21-K; C2 3MF 1 #33-E	C1 2MF 1 #21-AD; C2 1MF 3 #21-L
	C3 1MF #33 per D-10454. 1 Jack #225-A	C3 2MF #33 per D-10460. 1 Jack #225-A	C3 1MF #33 per D-10454. 1 Jack #225-A	C3 2MF #33 per D-10460. 1 Jack #225-A

WIRING OF CONDENSERS C2



NOTES

The #225 Jack shall be mounted at the test board or in the net work jack panel as specified.



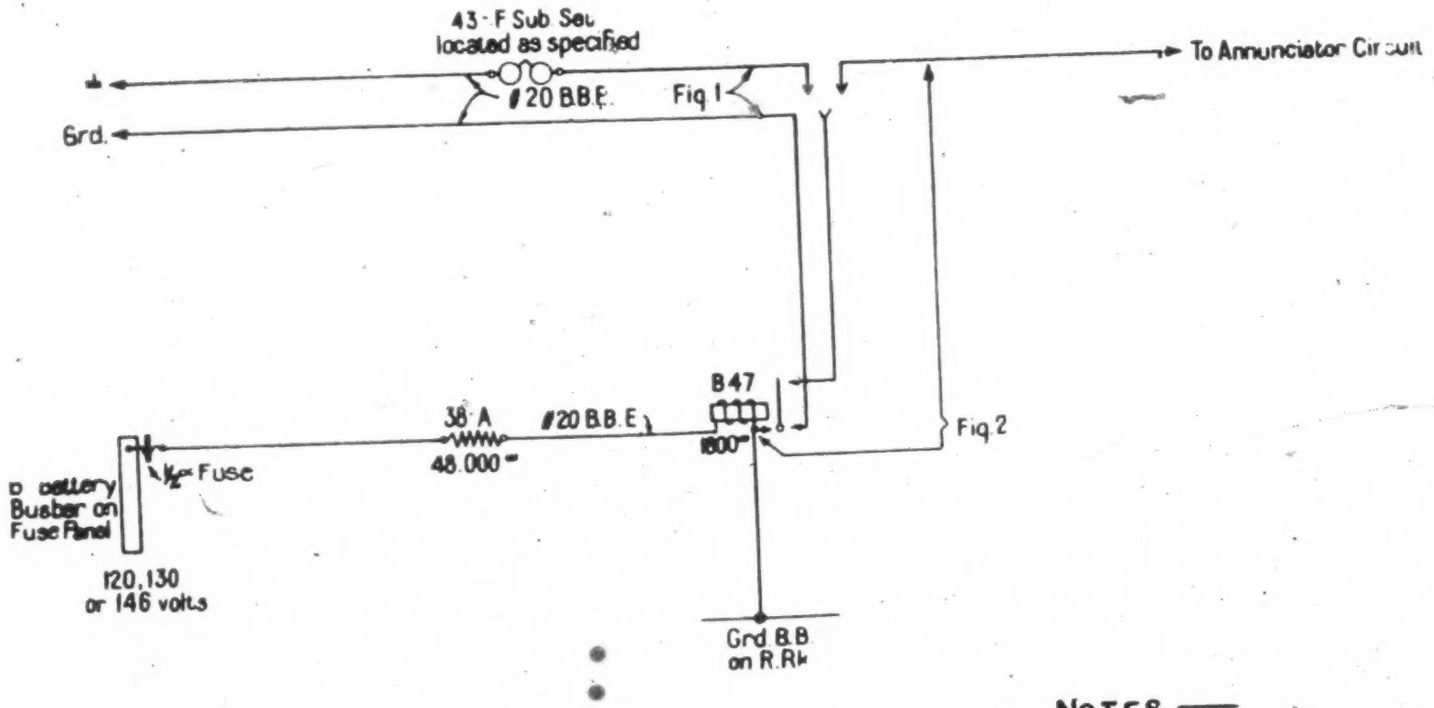
15509

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

POWER EQUIPMENT
NO-VOLTAGE ALARM CIRCUIT
For Telephone Repeater "B" Battery

185-B-79
Standard
Replacing 705-118
Replacing 185-B-79
of 11-9-18

Engrossed by [illegible]
Drafting [illegible]
Checked by [illegible]
Redrawn on account of condition of tracing
Log No S-2585, 5-8-21.
ISSUE 3



APPARATUS

1 Relay B 47 (638-A Mtg. Plate if not on R. Rk.)
1 Resistance # 38-A
1 Fuse #35-F
1 Subscribers Set #43-F with distinctively toned gongs as specified

NOTES

1. Fig. 1 shall be used when separate alarm bells are specified
2. Fig. 2 shall be used when an annunciator system is specified
3. This circuit to be used with all installations of vacuum bulb type telephone repeater equipment using storage cells for "B" battery.

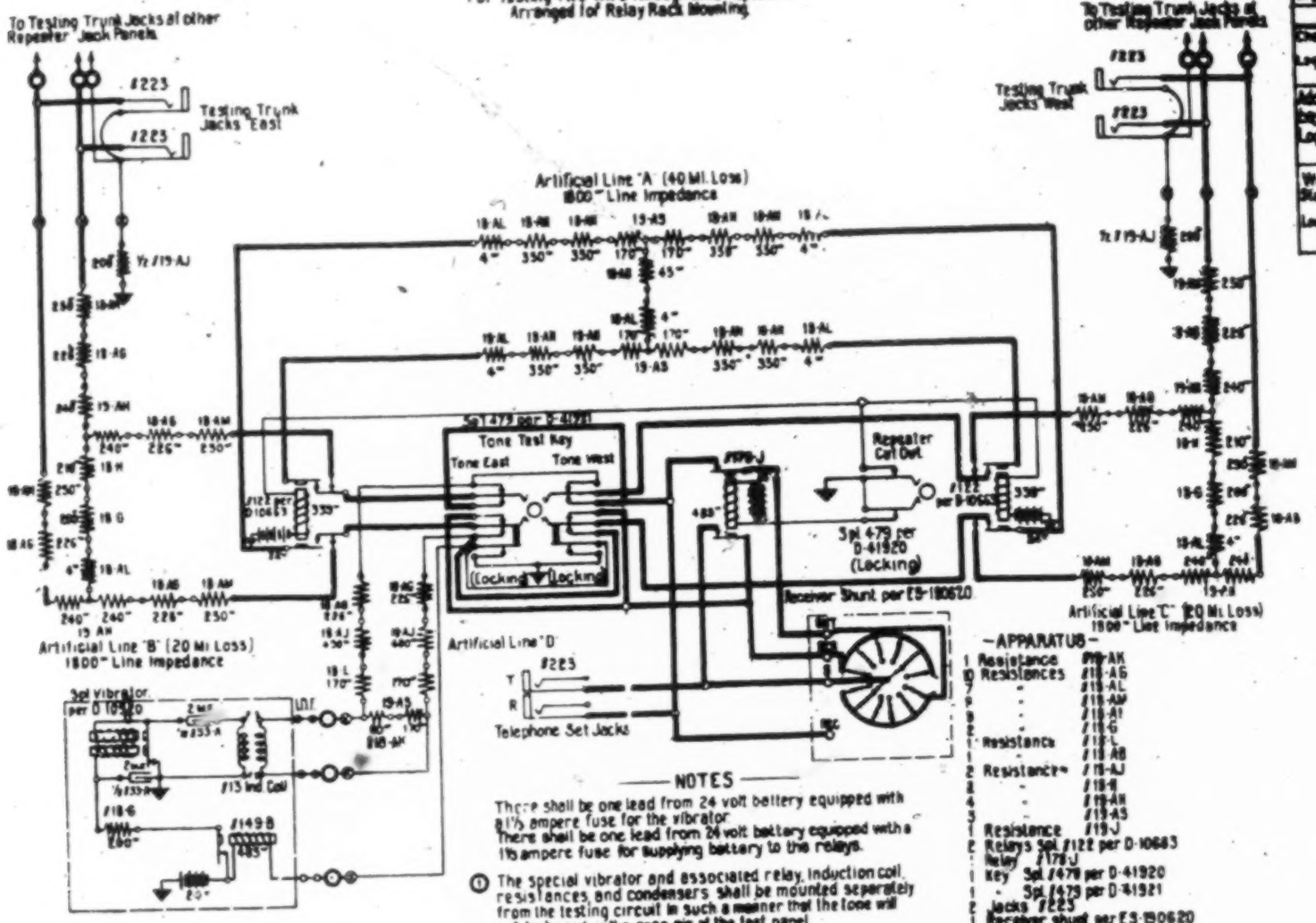
15510

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TESTING CIRCUIT

For Testing Two Wire Through Line Repeaters
Arranged for Relay Rack Mounting

156-BX-99
Standard
Replacing 704-1-80.



NOTES

There shall be one lead from 24 volt battery equipped with a ½ ampere fuse for the vibrator.
There shall be one lead from 24 volt battery equipped with a ½ ampere fuse for supplying battery to the relays.

① The special vibrator and associated relay, induction coil, resistances, and condensers shall be mounted separately from the testing circuit in such a manner that the tone will not be heard in the open air at the test panel.

⊗ Indicates terminal on testing circuit panel

○ Indicates terminal at top of bay

—APPARATUS—

1	Resistance	#19-AK
10	Resistances	#19-AG
7	"	#19-AL
9	"	#19-AM
8	"	#19-AJ
2	"	#19-G
1	Resistance	#19-L
1	"	#19-AB
2	Resistances	#19-AJ
8	"	#19-H
4	"	#19-AH
5	"	#19-AS
1	Resistance	#19-J
2	Relays Spl #122 per D-10683	
1	Relay #178-J	
1	Key Spl #479 per D-41920	
1	" Spl #479 per D-41921	
2	Jacks #223	
1	Receiver shunt per ES-190620	
1	Relay #149-D	
1	Resistance #196	
1	Condenser #334	
1	Induction coil #13	
1	Vibrator Spl per D-10520	

For Each Repeater Rack Bay
4 Jacks #223

Engineer [illegible]
Drafting Room [illegible]
Checked by
Log No. P726 1-19-48
ISSUE 1
Changed Register Block
Log No. [illegible]
135 Sht. 2
Added Terminals at top of bay 208
Log No. 27907 4722
1948 ISSUE 3
Web Provisional Made Standard.
Log No. 9-4307-11-1-22
ISSUE 4.

15511

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
WIRING OF 135 CYCLE RINGING LEADS

For Use with Two Wire Through Line Repeaters
Arranged for Relay Rack Mounting

187-B-4
Standard
Replacing 704-232

Engineer
Draftsman
Checked by
Made Standard 11-7-22
Log No. P-758 +80-18

ISSUE 1
#19-G resistances were changed to #19-AJ
Log No. P 3135 12.1.1939

ISSUE 2
Added #18-BH Res. and note (12)
Log No. P 3394 6.8.21

ISSUE 3
#74-G Heat Coils were changed to 1/4 amp fuses
Log No. 27546 4-7-22

ISSUE 4
Was Prov. Made Standard. Wiring for interrupters and generators not shown on seperate figs. Removed Note (1)
Log No. S-4520 11-7-22

ISSUE 5

FIG. 1
For Offices Employing Interrupters

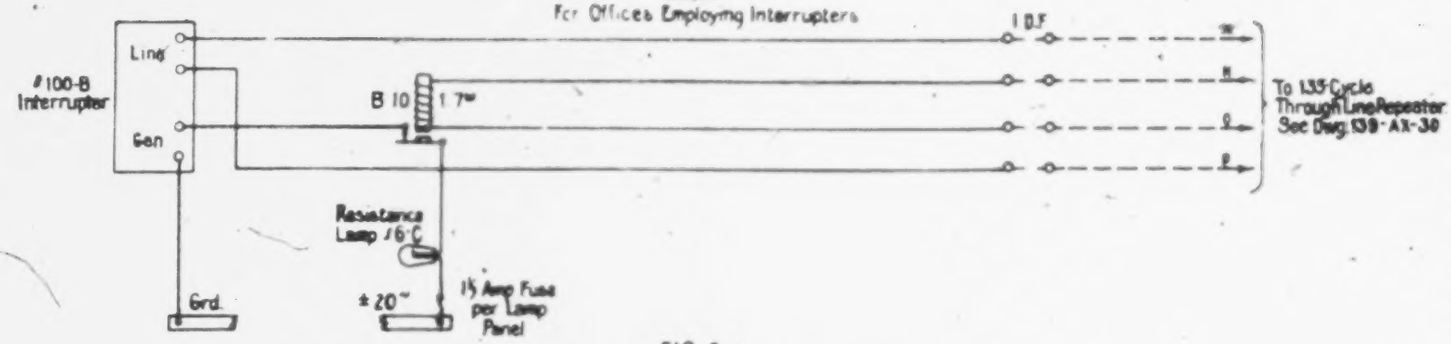
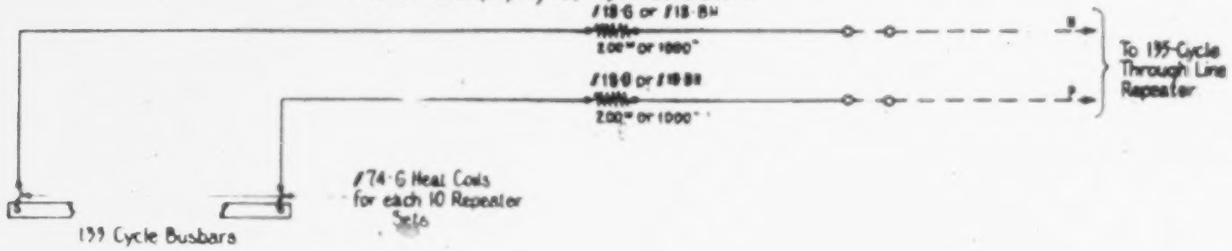


FIG. 2
For Offices Employing 135-Cycle Generators



APPARATUS

— For Offices Employing Interrupters —

1 Relay B-10 for each Repeater Set
1 Interrupter #100-B
1 Resistance Lamp #6-C } For each 3 Repeater Sets
1 Bryant Receptacle #101401

— For Offices Employing 135 Cycle Generators —

2 Resistances #19-G or #18-BH for each Repeater Set (12)

NOTE

(12) No 18 BH resistances (1000 ohms) shall be used for ringing leads to repeaters when used on circuits which are compolsited for metallic telegraph

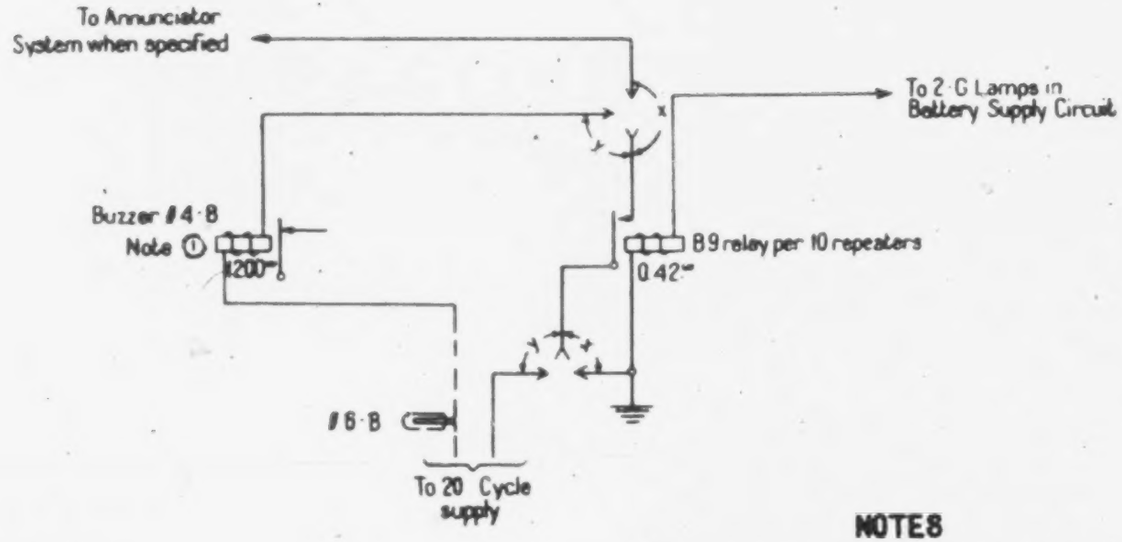
15512

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
AUXILIARY SIGNAL CIRCUIT
For telephone Repeater Filament Alarm Signals
Arranged for relay rack mounting

191-B-88
Standard

Engineer
Draftsmen
Checked by
Log. No. P-4721-8-25-20
Issue 1
Was Provisional
Made Standard
Log No. S-4270 10-30-22
ISSUE 2



APPARATUS

1 Relay B9 for each 10 repeater sets
1 Buzzer #4-B for each 3 battery supply bays

NOTES

① When an annunciator system is used for the filament alarm signals omit the #4-B buzzer and use 'X' wiring. When the annunciator system is not required use 'y' wiring.
② There shall be one B9 relay for each 10 repeater sets
③ B9 relays and buzzer shall be located at the relay rack with the battery supply equipment

15513

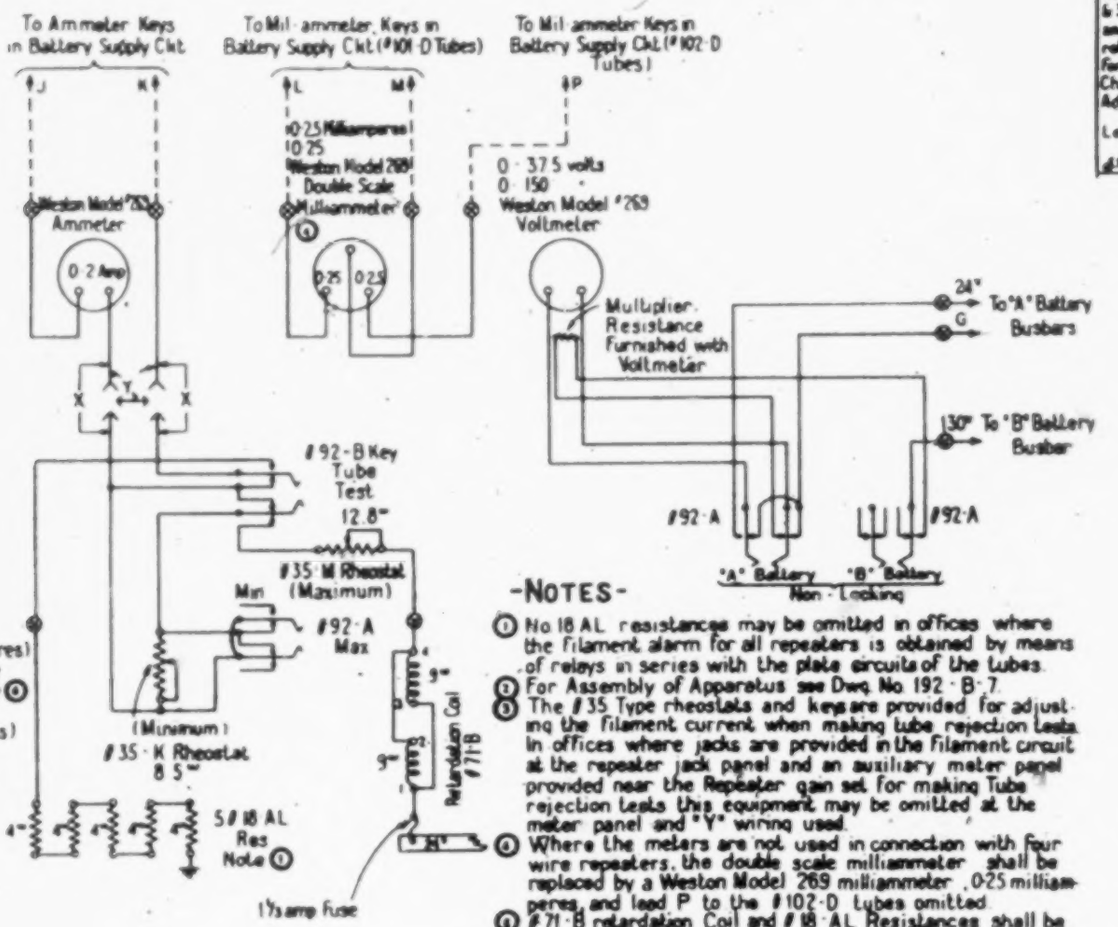
AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

Cordless Ammeter, Milliammeter and Voltmeter Circuits
For use with Reading Type Telephone Repeaters

191-B-99
Standard
Replacing 704-X-803
Repl 191-B-99 of 10-30-22

Engineer
Draftsman
Checked by
Made Standard 10-30-22
Redrawn:-
Removed 178-A Switch, 1.1 Lock, key & 92 B key for adjusting plate potential when making 1.1 tests. Added 35-K & 35-M rheostats 92 A and 92-B Keys, 71 B ret. coil and 18 A.L. res. for tube rejection tests. Changed Notes 1 and 3. Added Note 6
Log No. 5 4806 4-27-23
Issue 5



-APPARATUS-

1 Weston Model 269 ammeter (0-2 amperes)
1 Weston Model 269 milliameter, double scale (0-25 and 0-75 milliamperes) Note 2
1 Weston Model 269 voltmeter with multiplier (0-37.5 volts and 0-150 volts)
2 Keys #92 A
1 Key #92 A
1 Key #92 B
1 Rheostat #35-M
1 #35-K
5 Resistances #18 AL
1 Retardation Coil #71-B
Note 1

-NOTES-

1. No 18 AL resistances may be omitted in offices where the filament alarm for all repeaters is obtained by means of relays in series with the plate circuits of the tubes.
2. For Assembly of Apparatus see Dwg. No. 192-B-7.
3. The #35 Type rheostats and keys are provided for adjusting the filament current when making tube rejection tests. In offices where jacks are provided in the filament circuit at the repeater jack panel and an auxiliary meter panel provided near the Repeater gain set for making Tube rejection tests this equipment may be omitted at the meter panel and "Y" wiring used.
4. Where the meters are not used in connection with four wire repeaters, the double scale milliammeter shall be replaced by a Weston Model 269 milliammeter, 0-25 milliamperes, and lead P to the #102-D tubes omitted.
5. #71-B retardation Coil and #18-AL Resistances shall be located as specified.
6. ⊗ Designates terminal punchings on meter panel.

15514

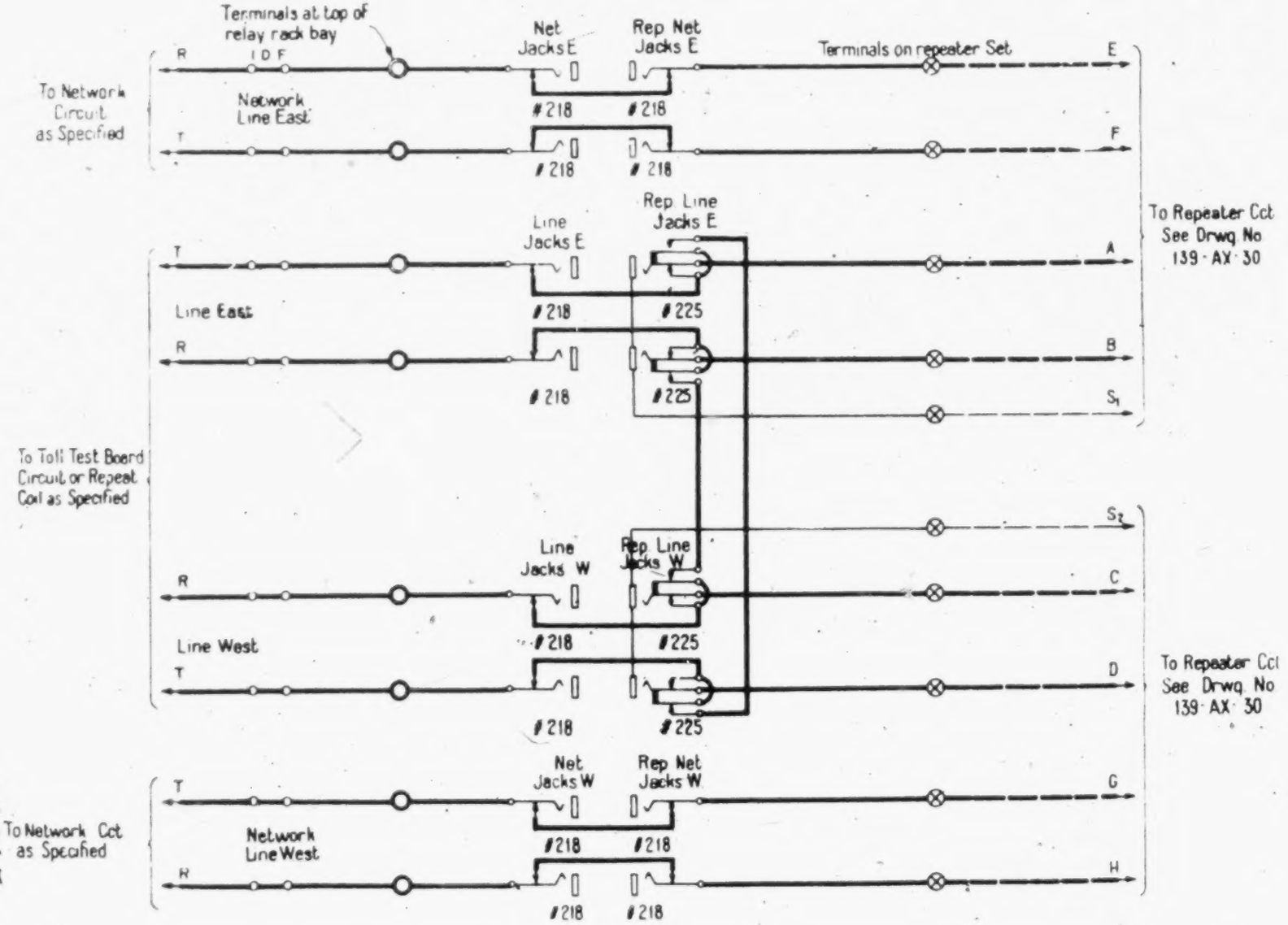
AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
REPEATER JACK CIRCUIT
Arranged for Relay Rack Mounting

191-B-100
Standard
Replacing 704-X-807

Engineer [illegible]
Draftsmen [illegible]
Checked by
Log P-4719-8-25-20
ISSUE 1

Was Provisional
Made Standard
Log No. 3-4306 11-1-22
ISSUE 2



AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TALKING AND MONITORING JACKS
For 22 Type Repeaters
Arranged for Relay Rack Mounting

192-B-1
Standard
Replacing 704-X-883

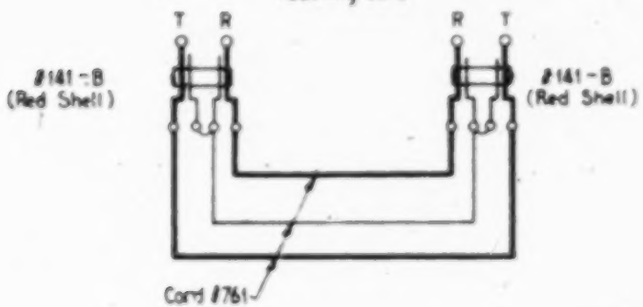
Engineer 2095
Draftsman O.M.
Checked by
Made Standard 11-1-22
Log No. R-4718-9-23-22
ISSUE 1

Code No. of Card Loss not shown.
Log No. R7728 9-8-22
ISSUE 2

Was Provisional. Made Standard. Lead "C" was formerly connected to battery supply circuit. Note Thread "To cable & element circuit," etc.
Log No. S-4288 11-1-22
ISSUE 3

Fig 1

Fig 2
Patching Cord



—NOTES—

(1) Patching cords in accordance with Fig 2 shall be provided for the two-wire repeater rack for patching the monitoring jacks to the telephone set and for patching the testing circuit to the repeater line jacks

(2) To cut repeater out insert a dummy plug in the tip monitoring jack

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

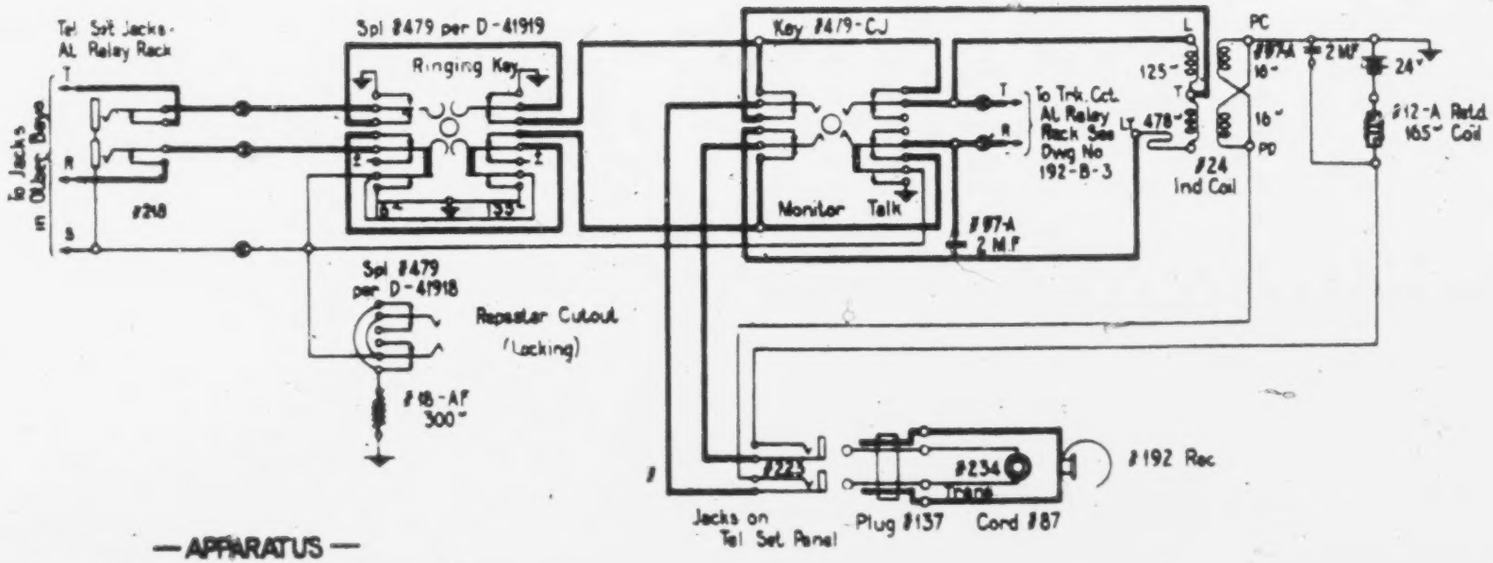
TELEPHONE REPEATER EQUIPMENT
TELEPHONE SET
For use with Reading Type Two-Wire Telephone Repeaters
Arranged for Relay Rack Mounting

192 - B - 2
Standard
Replacing 704 - 729

Engineer [illegible] P.P
Draftsmen D.M.
Checked by
Made Standard 11-1-22
Log No. B-4377-B-25-20
ISSUE 1

#97 Accord were #21-E
#218 Jacks were
labelled #128
Log No R7948 1-7-22
ISSUE 2

Was Provisional Made
Standard # 479-CJ
was Spl #479 per D-41918
Log No. S-4309 11-1-22
ISSUE 3



—APPARATUS—

Per Circuit
1 Key #479-CJ
1 " Spl #479 D-41918
1 " " #479 " D-41919
2 Jacks #223
1 Cord #87
1 Plug #137
2 Condensers #97-A
1 Retard Coil #12-A
1 Resistance #18-AF
1 Induction Coil #24

At each Relay Rack Bay
2 Jacks #218

—NOTES—

There shall be one lead from the 24 volt battery equipped with a 1½ ampere fuse for each circuit.

① There shall be one telephone set for each three relay rack bays containing "22" type telephone repeaters except where more may be required to permit two repeater attendants to work at adjacent repeaters simultaneously.

② For assembly of apparatus see Dwg. No. 192-B-10

⊛ Indicates terminal on mounting plate.

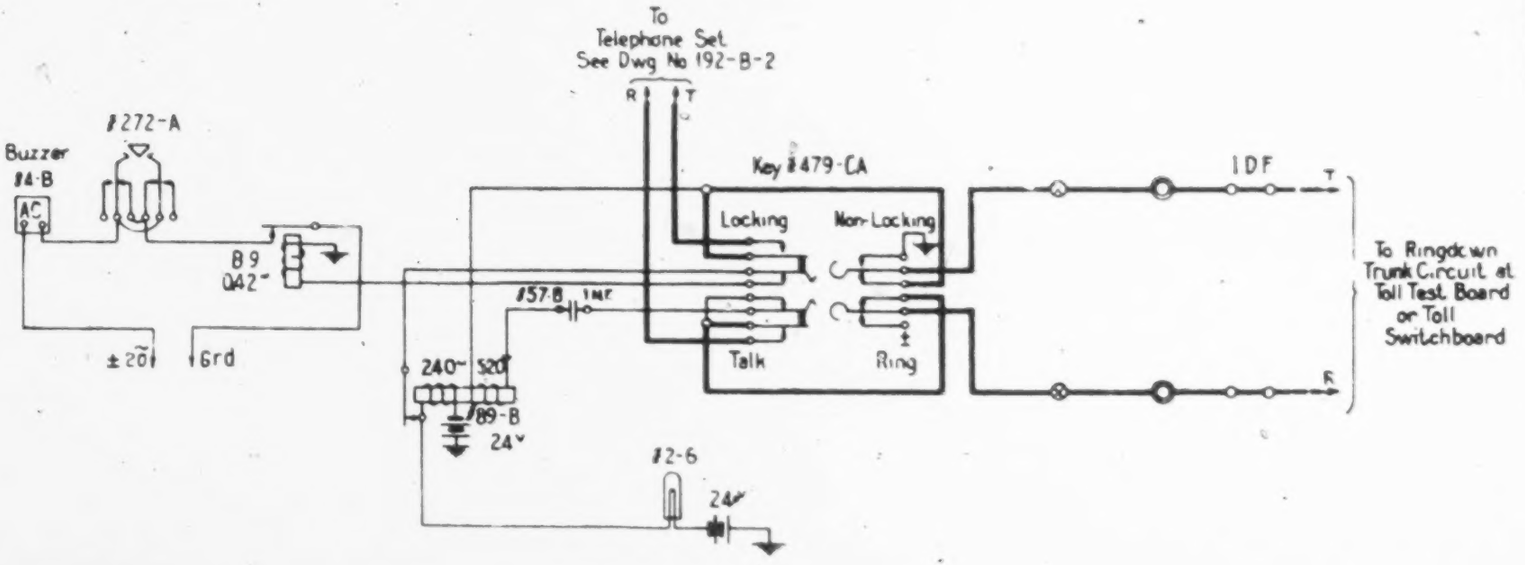
15517

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TWO WAY RINGDOWN TRUNK
For Use With "22" Type Repeaters
Arranged for Relay Rack Mounting

192-B-3
Standard
Replacing 704-X-806

Engineer
Draftsman O M
Checked by L
Made Standard M-1-22
Log No P-3-10-0
ISSUE 1
#57 B Condenser was #57a
Log No P 7513 4-7-22
ISSUE 2
Was Provisional Made
Standard #479-CA was
Std #479 per D-41917
Log No S 4310 11-1-22
ISSUE 3



—APPARATUS—

Per Circuit

1 Key #478-CA
1 Relay #89-B
1 Condenser #57-B
1 Lamp #2-G
1 " Cap #2-AY
1 " Socket #34
1 Relay B9
1 Key #272-A
1 Buzzer #4-B

—NOTES—

There shall be one lead from 24 volt battery equipped with a 1-1/3 ampere fuse per five circuits

⊗ Indicates terminal on telephone set mounting plate

○ Indicates terminal at top of relay rack bay.

15518

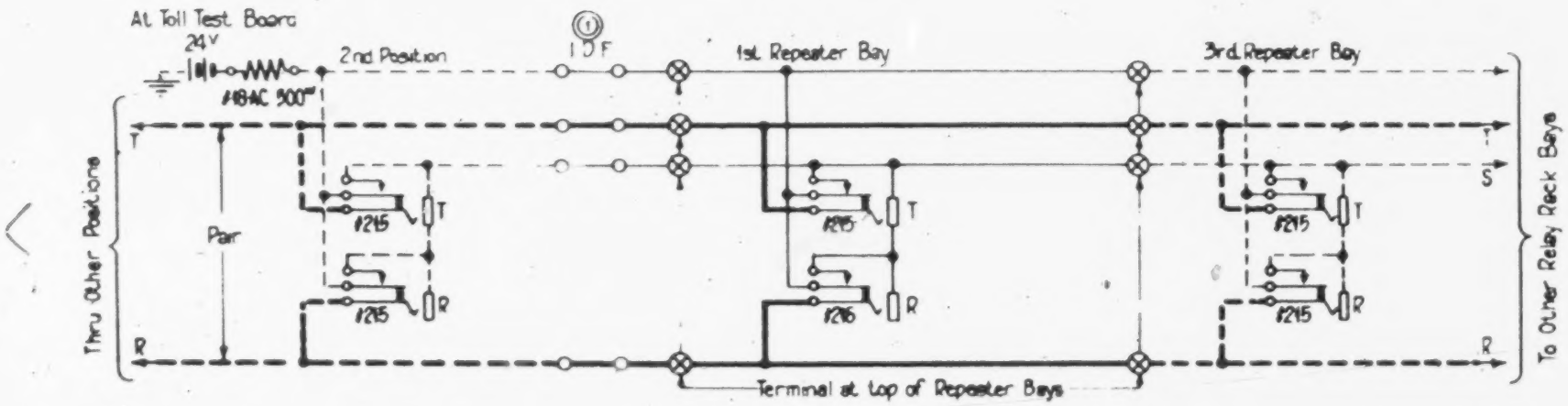
AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TEST BOARD – RELAY RACK INTERPOSITION TRUNK

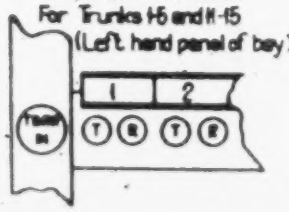
192-B-4
Standard
Replacing 704-X-721
Replacing 192-B-4 of 3/17/22

Engineer
Draftsman
Checked by
Redrawn Ring Jack was #223 Added Notes (3) and (4) Added figure showing arrangement of jacks for "In" and "Out" Trunks. Added test on ring jack
Log No. P7520 4-7-22
Issue 3

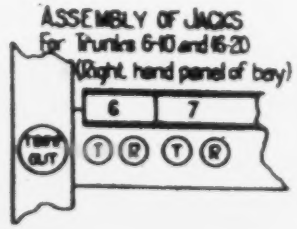
Was Provisional
Made Standard
At rep. rack, designs were 1st bay, 2nd bay, etc.
Log No. S-4327 11-3-22
ISSUE 4



ASSEMBLY OF JACKS
For Trunks 1-5 and 11-15
(Left hand panel of bay)



ASSEMBLY OF JACKS
For Trunks 6-10 and 16-20
(Right hand panel of bay)



APPARATUS

2 Jacks #215, for each relay rack bay

NOTES

(1) Wiring between the relay rack and the test board to be direct or through the I.D.F as specified.
(2) At relay rack, trunks 1 to 10 shall be multipled in the odd numbered bays, and trunks 11 to 20 multipled in the even numbered bays.
(3) In offices where four-wire telephone repeaters are to be used trunks 1-5 and 11-15 shall be run in cables separate from trunks 6-10 and 16-20. Trunks 1-5 and 11-15 shall be used for patching circuits on the input side of 4-wire repeaters and shall not be included in any cables carrying the output circuits of 4-wire repeaters. Trunks 6-10 and 16-20 shall be used for patching circuits on the output side of 4-wire repeaters and shall not be included in any cables carrying the input circuits of 4-wire repeaters.
(4) In offices where no four-wire telephone repeaters are to be provided, all test board-relay rack interposition trunks may be run in the same cable instead of separating "In" and "Out" circuits as specified in Note (3)

15519

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

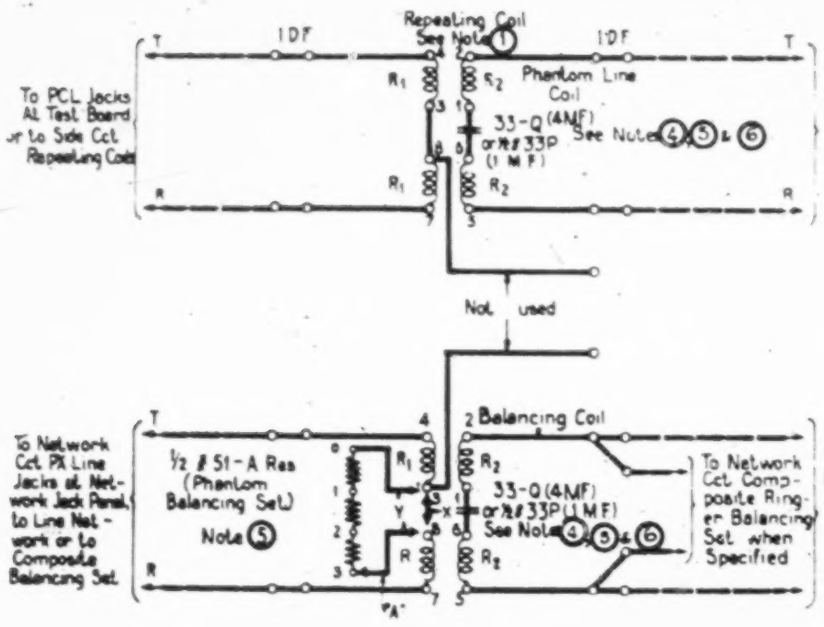
Phantom Line Coil and Repeating Coil Balancing Set
For Use Only On Phantom Circuits

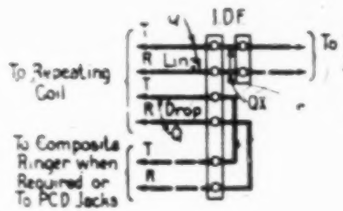
192-B-5
Replacing 70-I-X-559

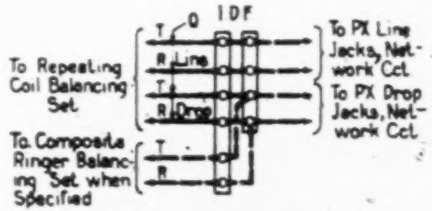
Craftsman O.M. Checked by
Log No. P-4714 8-25-20
ISSUE 1

Changed Note (4) Was Provisional Made Standard
Log No. S-2928 9-13-21
ISSUE 2

Added notes 4, 5 & 6. #33P condenser specified when 1 mf is required. Changed 55 coils to 75 coils.
Log No. S-4101 9-16-22
ISSUE 3







—APPARATUS—

1 Repeating Coil per Note (1)
2 Condensers #33-Q or 1 condenser #33P per Notes (4) & (6)
½ Resistance #51-A when specified Note (7)

Table 1

Coil No	Impedance Ratio Line Side Term. 4,3 - 8,7	Impedance Ratio Drop Side Term 2,1 - 6,5	Resistance R_1	Resistance R_2
75-A	1 To	1	22	21
75-B	1 -	1.62	14	21
75-C	1.62 -	1	22	13
75-D	1 -	2.66	8.5	22
75-E	2.66 -	1.	22	8.5

Table 2

Coil on Side Circuits	Connect Lead "A" to Point
No. 75-A	3
" 75-B	2
" 75-C	3
" 75-D	1
" 75-E	3

—NOTES—

(6) Where repeating coil does not form shunt preventing proper operation of direct current supervisory relays in cords or trunks, the condensers shall be omitted except on circuits equipped with DC metallic telegraph.

(1) Repeating coils shall be as specified and each shall be mounted on the same base with its balancing coil in the network circuit. The types of coils used are as shown in Table 1.

(2) Type A composite ringers only shall be used in connection with this circuit.

(3) Pairs marked "Q" in the cabling diagram are duplex cable and pairs marked "QX" are in duplex distributing frame wire. Each pair marked "Q" or "QX" shall be in the same quad with the pair with which it would form a phantom.

(4) When repeating coils are used on small gauge cable circuits equipped for DC metallic telegraph, #33P (1MF) condensers shall be used, in all other cases where condensers are needed #33-Q(4MF) cond'rs shall be used.

(5) The same type of condenser shall be used in the line circuit and in the network. When 4 MF are required (see Note 4) the condenser shall preferably be #33-QD, #33-QE, #33-QG or #33-QH but #33-QF may be used.

(7) Use "Y" wiring when phantom balancing set is required. Use "X" wiring when phantom balancing set is not required. The phantom balancing set shall be provided as shown only for phantom lines derived from composited side circuits and shall be furnished only when specified. Lead "A" shall be connected as shown in Table 2. The Phantom Balancing Set, where specified shall be located adjacent to the associated repeating coil or in any other convenient location on the coil rack.

15520

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

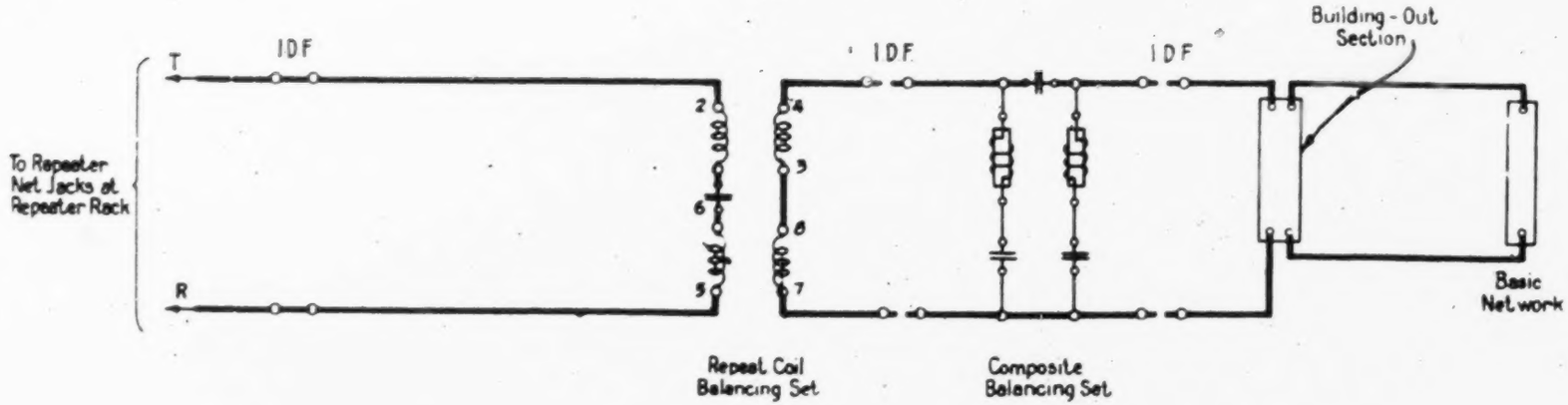
TELEPHONE REPEATER EQUIPMENT

NETWORK CIRCUIT

Without Jacks

192-BX-6
Standard
Replacing 704-X-723

Engineer Draftsman O.M. Checked by Made Standard 11-1-22 Log No. P-4713-8-23-20 ISSUE 1
Removed Half Load Retard. Coil. Log No. P 5713 4-12-21 ISSUE 2
Marked replacing 704-X-723. Log No. P 6566 9-27-21 ISSUE 3
Was Provisional Made Standard Log No. S-4311 11-1-22 ISSUE 4



—NOTES—

The balancing equipment for each circuit shall be furnished only as specified.

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

RINGING RELAY CIRCUIT

For Two Wire Cable Type Repeater Circuits

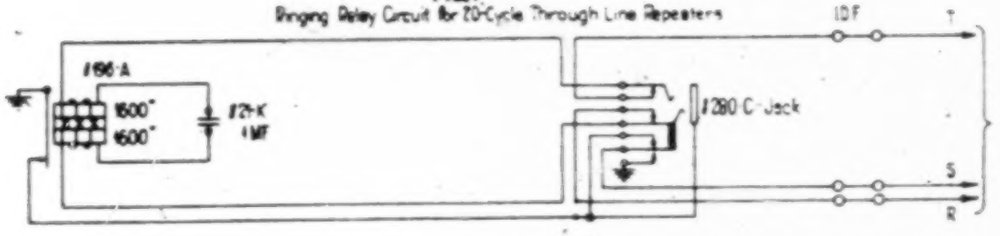
193-B-82
Standard
* Partly Replacing 187-B-22

Logged (21-A)
Drawn MCC
Checked
Made Standard 11-1-22
Log No P-8714 4-10-21
ISSUE 1

Infigt S & R Lead from relay were reversed at jack
In Fig 3 #91-A coil was #71-C, & D-76423 coil was ½ D-14692, #57-G or ½ #33 coil was #57-A or ½ #33-A (2 MF) in parallel with #57-F or ½ #33-L (½ MF)
Log No P7363, 3-11-22
ISSUE 2

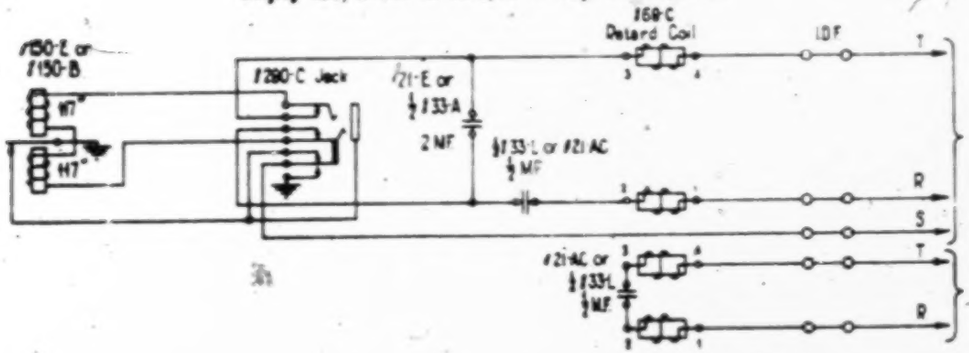
Was Provisional Made Standard Added Note ① and 150-B relay Added 21-E & 21-AC condensers. M.A.S.
Log No 5-4142. 11-1-22
ISSUE 3

FIG. 1
Ringing Relay Circuit for 20-Cycle Through Line Repeaters



To Repeater Circuit Line Side of #33-Q or #57-Q Condensers. See Dwgs. Nos. 137-AX-72 or 139-AX-30

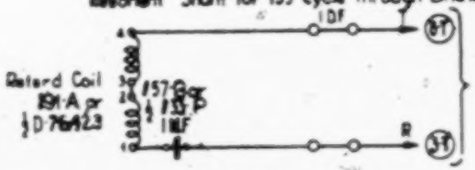
FIG. 2
Ringing Relay Circuit for 135-Cycle Through Line Repeaters



To Repeater Circuit Line Side of #33-Q or #57-Q Condensers. See Dwgs. Nos. 137-AX-72 or 139-AX-30

To Repeater Circuit Net Side of #33-Q or #57-Q Condensers. See Dwgs. Nos. 137-AX-30 & 139-AX-30

FIG. 3
Resonant Shunt for 135 Cycle Through Line Repeaters



To Through Line Repeater, Output Transformer Terminals 8T and 3T

-APPARATUS-

FIG. 1
1 Relay #196-A
1 Condenser #21-K
1 Jack #280-C

FIG. 2
1 Relay #150-E or #150-B
1 Condenser #33-A or #21-E
1 Condenser #33-L or #21-AC
1 Jack #280-C
1 Retardation Coil #168-C

FIG. 3
For Coil Rack Mounting
1 Retard Coil per D-76423
1 Condenser #33-P
For Relay Rack Mounting
1 Retardation Coil #195-A
1 Condenser #57-B

— NOTES —

① The #150-E relay may be replaced by a #150-B relay in cases where sufficient signaling range cannot be obtained with #150-E relay on account of interference

② Jacks to be mounted at the relay rack or coil rack near the associated relays

15522

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

METALLIC COMPOSITE BALANCING SET

For Balancing Metallic Composite Sets

193-B-99
Standard

Engineer [illegible]
Draftsman
Checked by

Log No P-5972 3/2/21
ISSUE 1

Added code of ½ 44-L coil Added D-Spec No. of ½ M.F cond. Fig 1 Removed note.
Log No P-7492, 4-1-22
ISSUE 2

Was Provisional Made Standard
Log No. S-4313 11-1-22
ISSUE 3

FIG. 1
SIDE CIRCUIT ARRANGEMENT

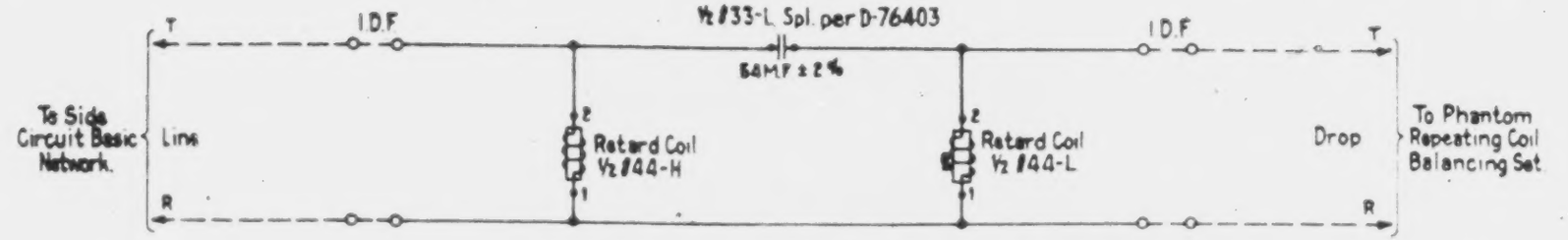
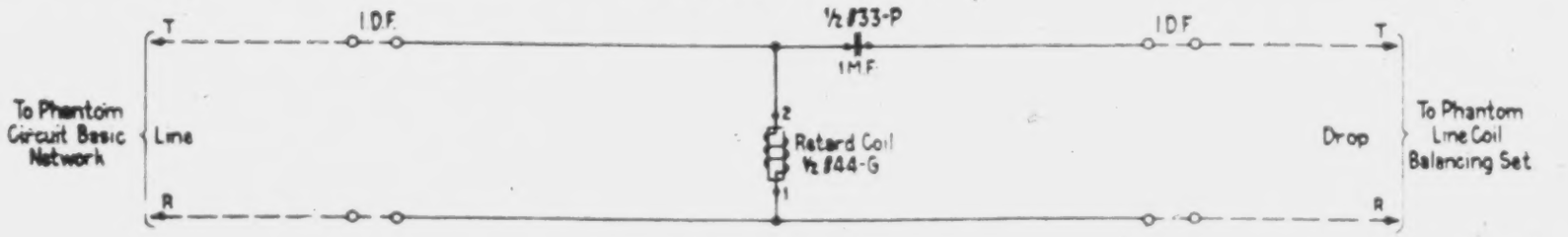


FIG. 2
PHANTOM CIRCUIT ARRANGEMENT



— APPARATUS —

FIG. 1
½ Retardation Coil #44-H
½ " " #44-L
½ Condenser Spl. #33-L per D-76403

FIG. 2
½ Retardation Coil #44-G
½ Condenser #33-P

15523

American Telephone & Telegraph Co.
Department of
Development & Research

TELEPHONE REPEATER EQUIPMENT
BATTERY SUPPLY CIRCUIT

For use with Reading Type Two-Wire Telephone Repeaters
For Offices where only two Tubes are connected in Series

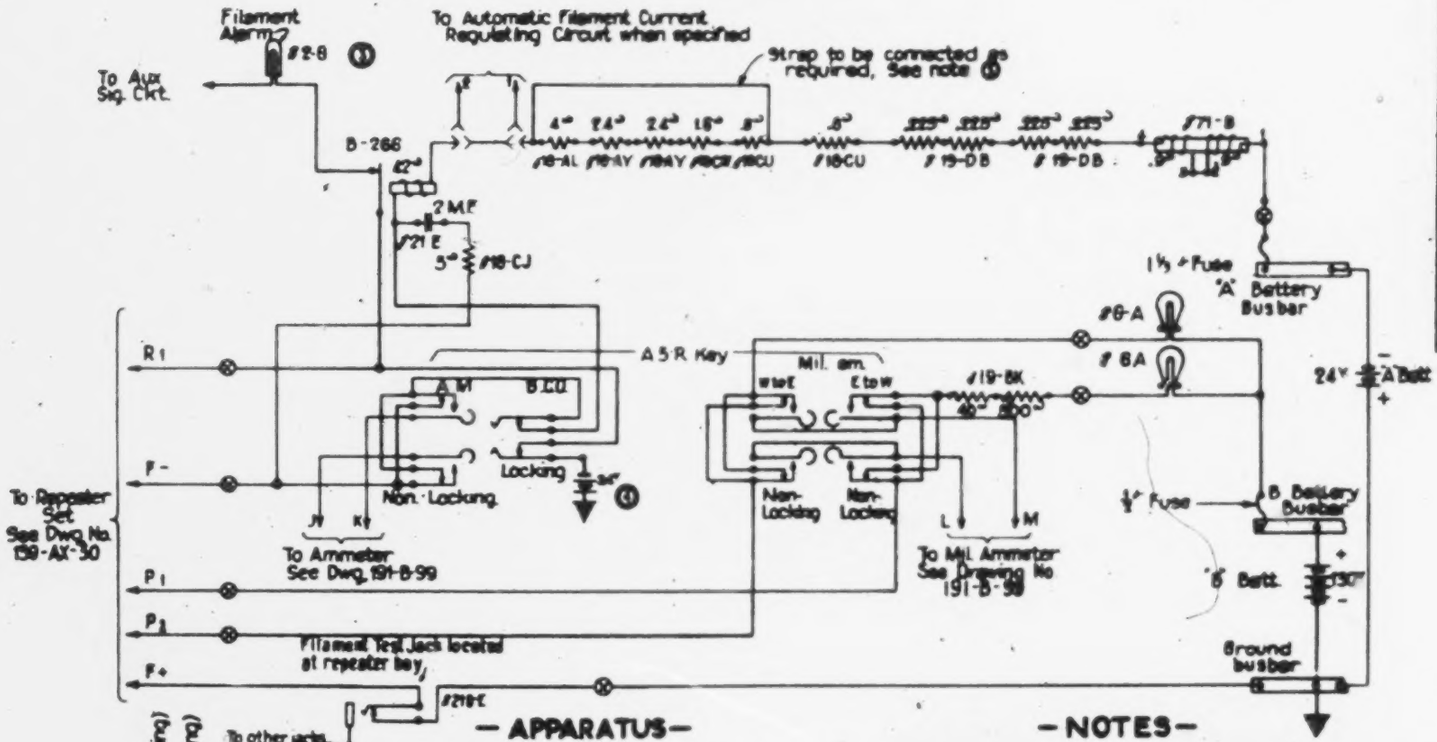
191-B-10
Standard
Partly Replacing
191-B-95

Engineer J.J.
Draftsman
Checked by
Log No. P8772, 11.15.22
Issue 1

Was Provisional. Made Standard
Log No. S-4392, 11-9-22
ISSUE 2

A5R key was A5H
Log No. S-4645, 2-26-23
ISSUE 3

In note (2) 7/15 Ga. cable were specified max. res. of one ohm per mile. Changed to #16 Ga. Jack and note (3) Res. of field coil was shown as 3" per unit. E to W keys were W. W to E keys were W. Mil-am keys were thrown to left for E-W and to right for W-E.
Log No. S-4803 4.22.23
ISSUE 4



—APPARATUS—

1	Key A5R
1	Retardation Coil #71-B
1	Resistance #18-CJ
1	" #18-AL
1	" #18-CW
2	" #18-AY
2	Resistances #18-CU
2	" #19-DB
2	Resistance Lamps #8A
2	Bryant Receptacles #101401
1	Relay B-266
1	Lamp #2 B
1	Cap #2-AY
1	Condenser #21-E
1	Resistance #19-BK
1	Jack #218-E Note (1)

—NOTES—

4 Indicates terminal at top of battery supply bay
(1) Resistances in filament circuit shall be provided as shown.
Sufficient resistance shall be strapped out to maintain the proper filament current.
(2) #16 Gauge non duplex lead covered Cable shall be used between fuse board and relay rack and between the relay rack and repeater set. The resistance of the wiring and cabling in the battery supply circuit shall not exceed 1.0 ohm
(3) Lamp Socket is a part of A5R Key. Lamp and cap are specified separately.
(4) There shall be one lead from the 24 V battery equipped with a 1½ ampere fuse for supplying the signalling battery to each circuit.
(5) Filament circuit test jack shall be furnished when specified. When furnished the jack shall be located in the repeater jack panel.

15524

AMERICAN TELEPHONE & TELEGRAPH CO
Department of Development and Research

TELEPHONE REPEATER EQUIPMENT

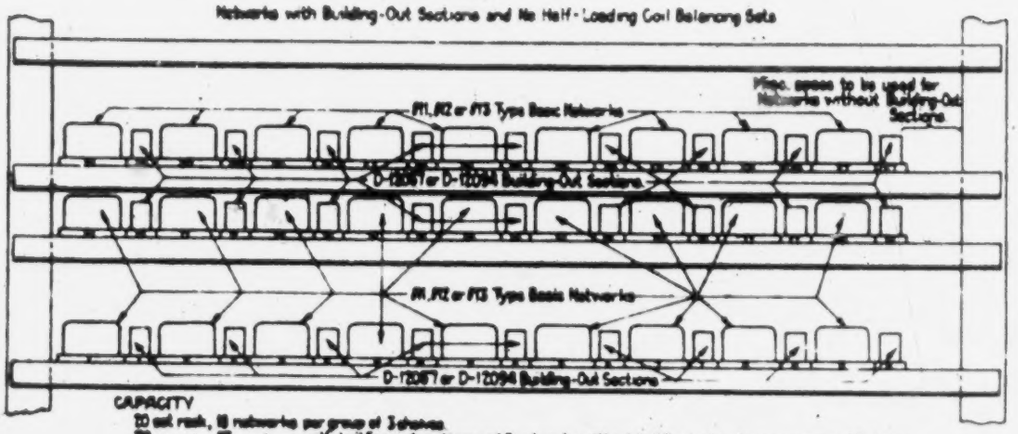
ARRANGEMENT OF BASIC NETWORKS, BUILDING-OUT SECTIONS AND HALF LOADING COIL BALANCING SETS AT COMPOSITE RACK

142-A-65
Standard
Replacing 704-A-557
" 172-BX-31

Engineer
Draftsman
Checked by A.L.G.
Log No. S-23313-9-13/71
ISSUE 1
Partial replacing
172-BX-51
Log No. S-[illegible]-9-14-72
ISSUE 2

FIG 1

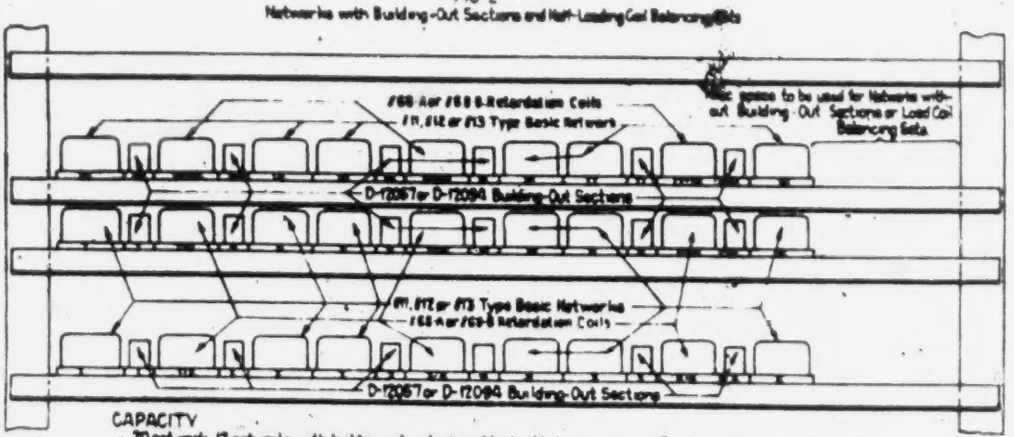
Networks with Building-Out Sections and No Half-Loading Coil Balancing Sets



CAPACITY
20 unit rack, 18 networks per group of 3 shelves
30 " " 27 " with building-out sections, and 3 networks without building-out sections, per group of 3 shelves

FIG 2

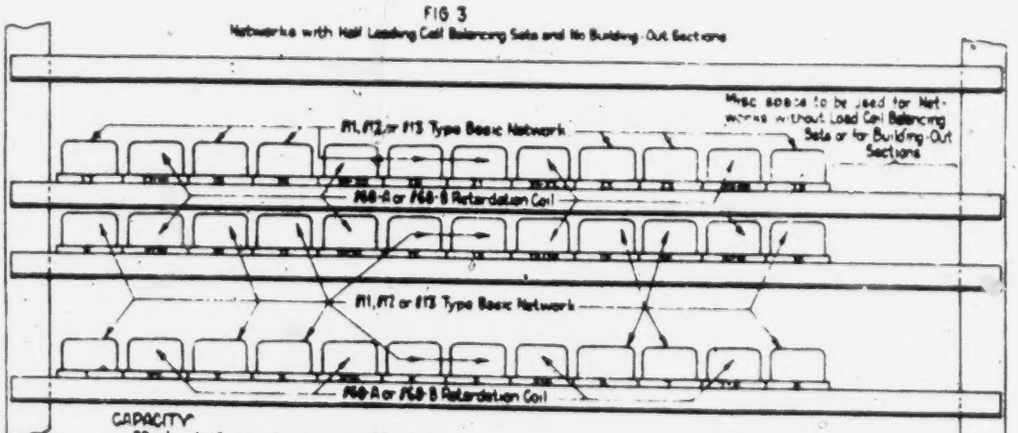
Networks with Building-Out Sections and Half-Loading Coil Balancing Sets



CAPACITY
20 unit rack, 12 networks with building-out sections and load coil balancing sets, and 3 networks without building-out sections and load coil balancing sets, per group of 3 shelves.
30 unit rack, 18 networks with building-out sections and load coil balancing sets, and 3 networks without building-out sections and load coil balancing sets, per group of 3 shelves

FIG 3

Networks with Half Loading Coil Balancing Sets and No Building-Out Sections



CAPACITY
20 unit rack, 18 networks per group of 3 shelves
30 " 24 " with load coil balancing sets, and 6 networks without load coil balancing sets, or 12 building-out sections, per group of 3 shelves

15525

AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
NETWORKS

Arrangement of Composite Balancing Sets at Composite Rack

172-B-32
Standard
Replacing 172-B-32 of 1/21/16

Engineer
Draftsmen
Checked by

Redrawn, Marked Replacing 172-B-32 of 1/21/16 Omitted Repeating Coil Bal Set.
Log No. 14263 July 18, 1916

Issue 3
Log No. 18478 Apr. 13, 1917

Issue 4

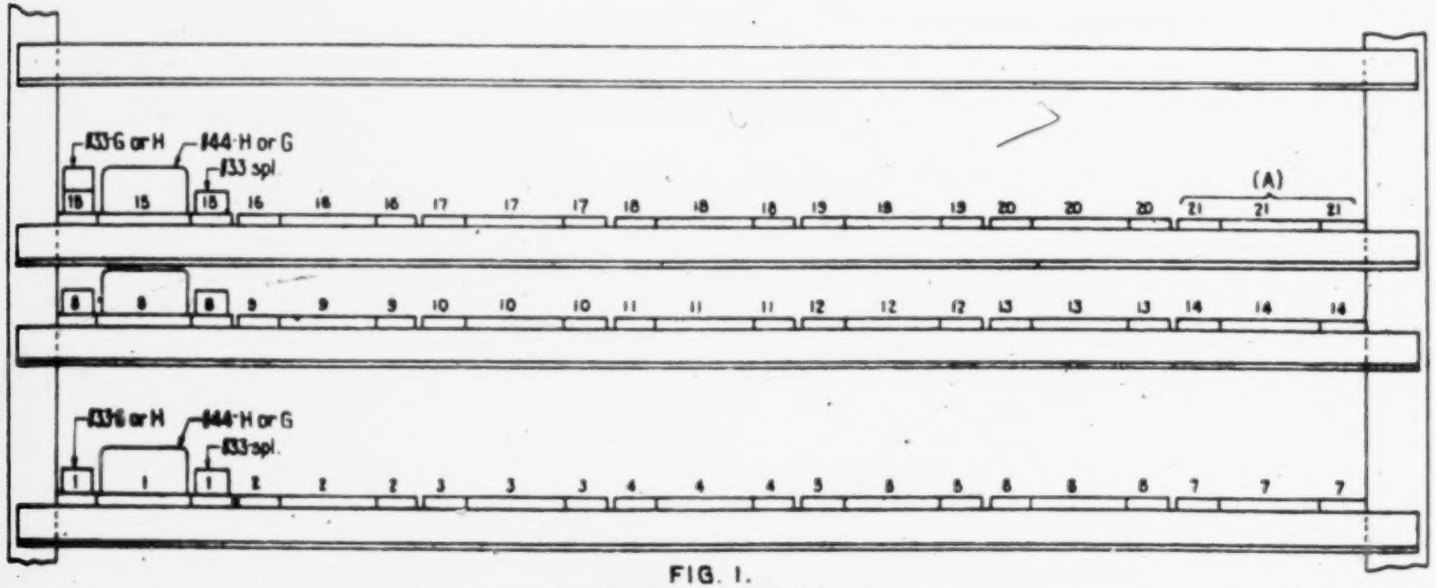


FIG. 1.

COMPOSITE BALANCING SETS
Capacity 20 Set Rack, 12 Sets per Group of 3 Shelves
" 30 " " 21 " " " " 3 "
(A)-Terminated at different Distributing Frame Block, when equipped

15526

AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TWO-WIRE THROUGH LINE REPEATER
Assembly of Apparatus at Relay Rack.

187-BX-5
Standard
Replacing 704-X-185

Engineer
Draftsman
Checked by

Log No. P-878 2-5-18

ISSUE 1

Potentiometer was
Designated "C" battery box
as per ES-203874.
Changed Title.

Log No. P 4704 8.16.28

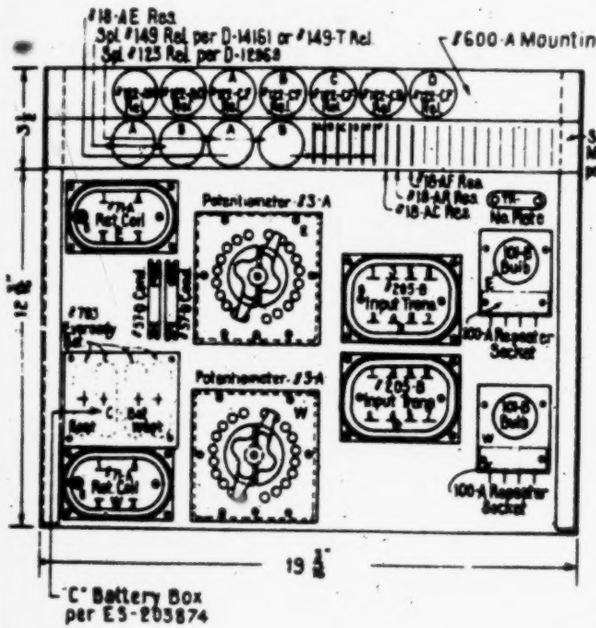
ISSUE 2

Was Provisional
Made Standard

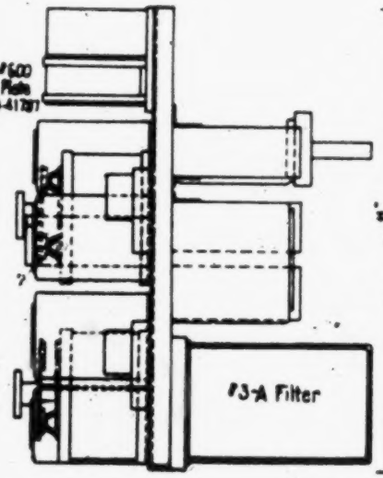
Log No. 3-4318 11-3-28

ISSUE 3

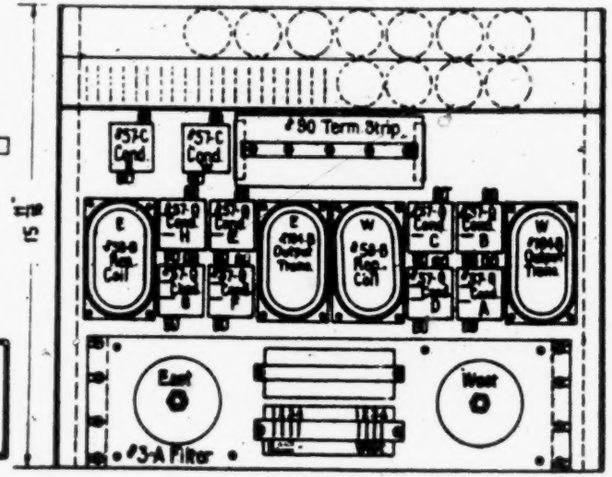
FRONT VIEW

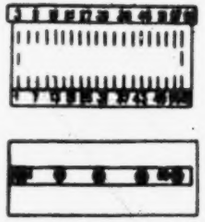


END VIEW



REAR VIEW





Numbering of Terminal Strip

NOTES

Letters refer to reference letters on Dwg No. 139-AX-30

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

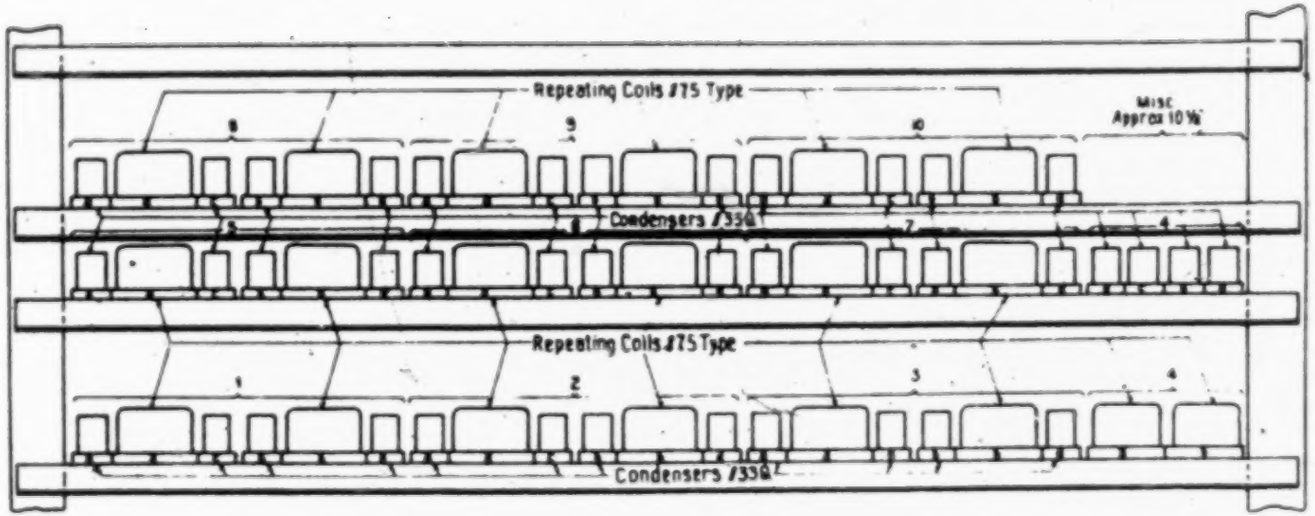
TELEPHONE REPEATER EQUIPMENT
PHANTOM SETS AND REPEATING COIL BALANCING SETS.

Line and Network Coils Mounted on the Same Base
Arrangement of Composite Rack.

187-B-90
Standard
Replacing 176-BX-32

Engr
Drawn by
Checked by
Log No 1/ 1571

ISSUE 1
was issued as interim Standard replacing 176-BX-32
Log No S 2327 & 3121
ISSUE 2
Use of #75 Type Repeating Coils specified in place of #55 Type.
Log No S-3615 8-9-22
ISSUE 3



a and b - Condensers associated with line coils.
c and d - " " " balancing coils.

Capacity
20 Set Rack, 6 Phantom Sets and 6 Phantom Balancing Sets, or 12 Simplex Sets and 12 Simplex Balancing Sets per group of 3 shelves
30 " " ,10 " " " 10 " " " " " or 20 " " " 20 " " " " " "

15528

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
METER PANEL

For use with Reading Type Telephone Repeaters

182-B-7
Standard
Replacing 704-X-1075

Engineer
Draftsmen
Checked by
Log No P-4712-6-25-20
ISSUE 1

Removed note
can covers
Log No P7922 4722
Issue 2

Was Provisional
Made Standard
Log No. 54266 10-30-22
ISSUE 3

#176-A Switch was shown in location of 35-M Rheostat. #19-L Rheostat was shown in location of #35-K Rheostat. #27-C Key was shown in pos. of Tube Test Key
Log No 3-4807 4.2223
Rev ISSUE 4

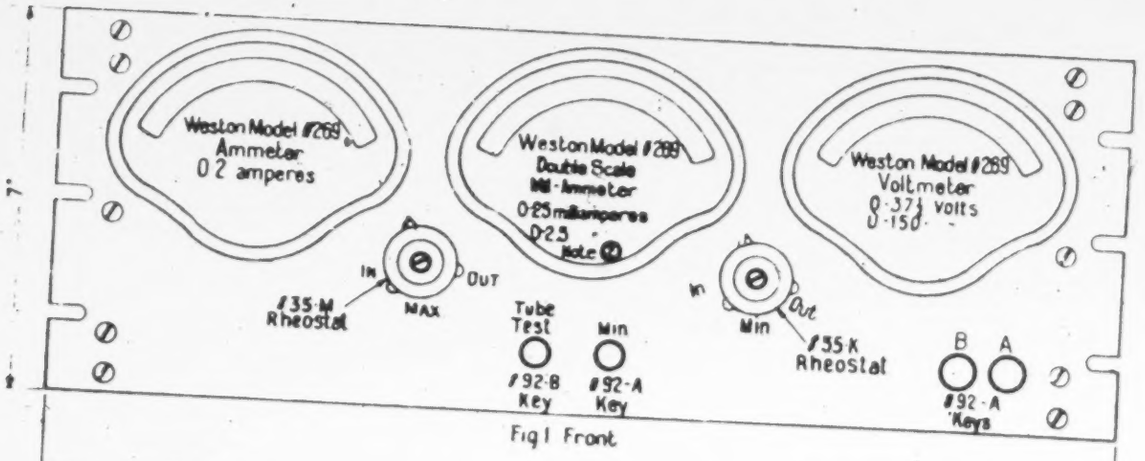


Fig 1 Front

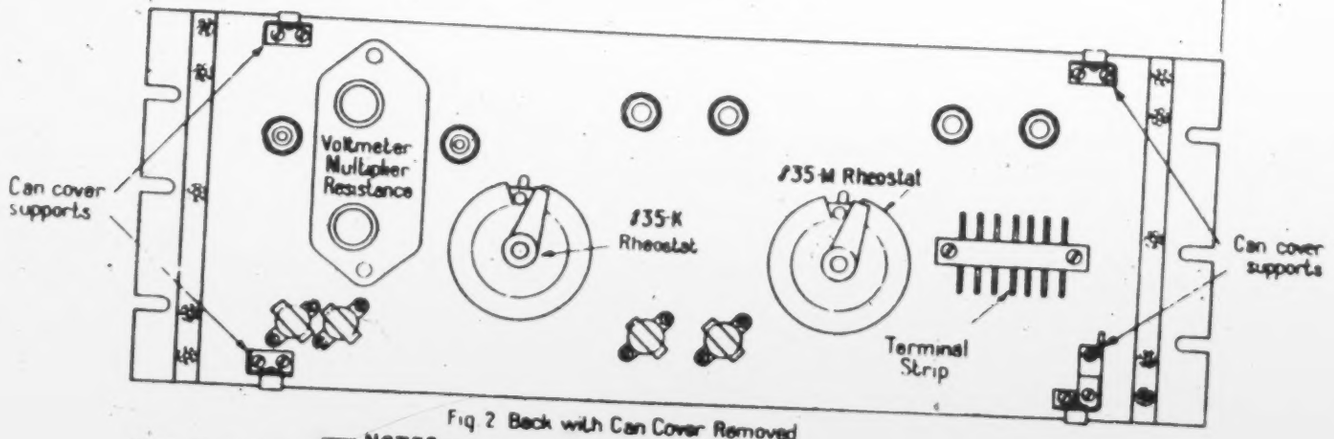


Fig 2 Back with Can Cover Removed

— NOTES —

(2) Double scale mil ammeter shall be replaced by a Weston Model 269 single scale mil ammeter, 0-25 milliamperes, in offices where the meters are not used for Four-Wire Repeater battery supply circu

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
BATTERY SUPPLY CIRCUIT
For "22" Type Repeaters
Assembly of Battery Supply Circuit Keys at Meter Panel

192-B-8
Standard
Replacing 704-X-884

Engineer
Draftsman
Checked by
Redrawn, added Fig 2
Was Provisional Made Standard
Log No. 3-4308-11-1-22
Issue 3

Fig 1 : Front View, 2 tubes in series

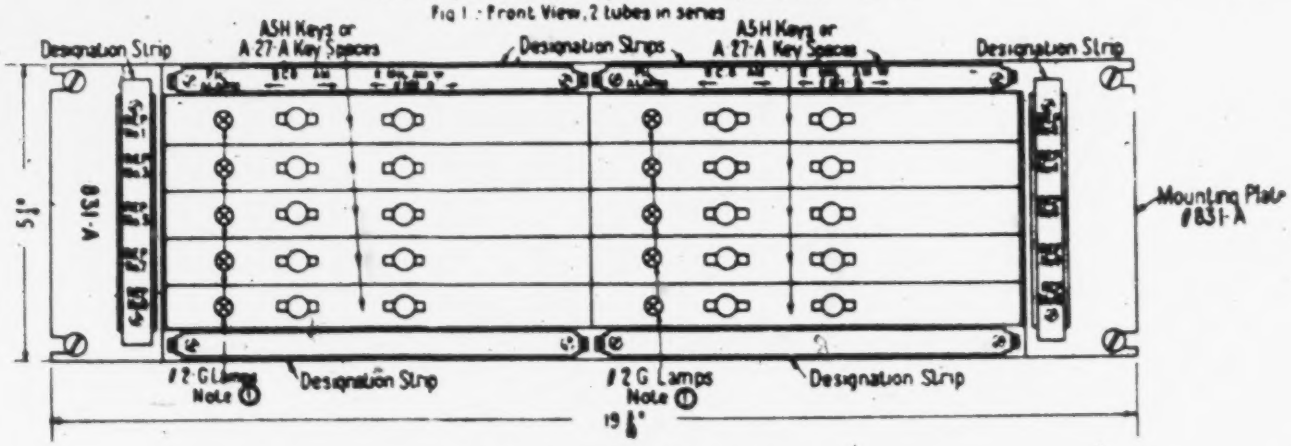


Fig 2 Front View, 4 tubes in series

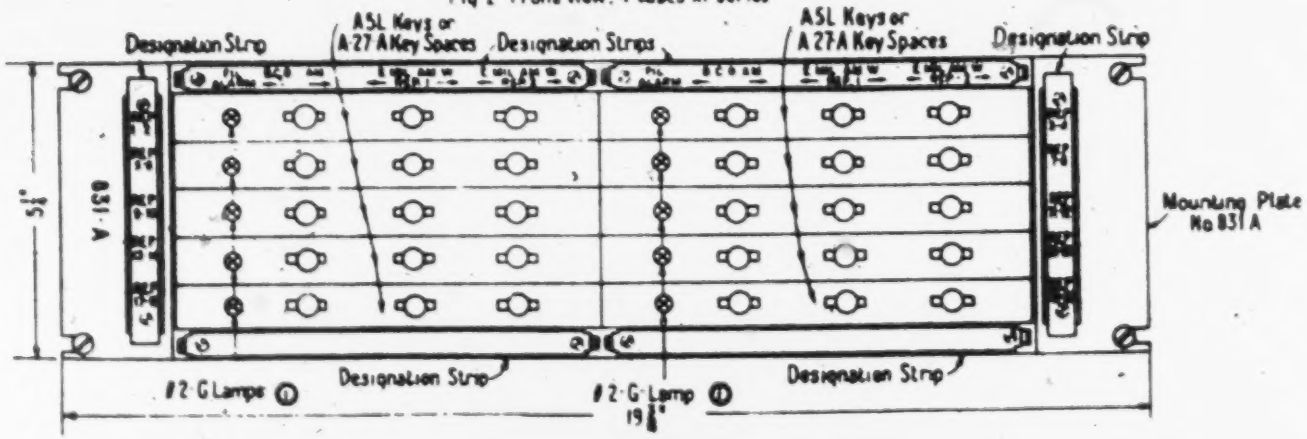
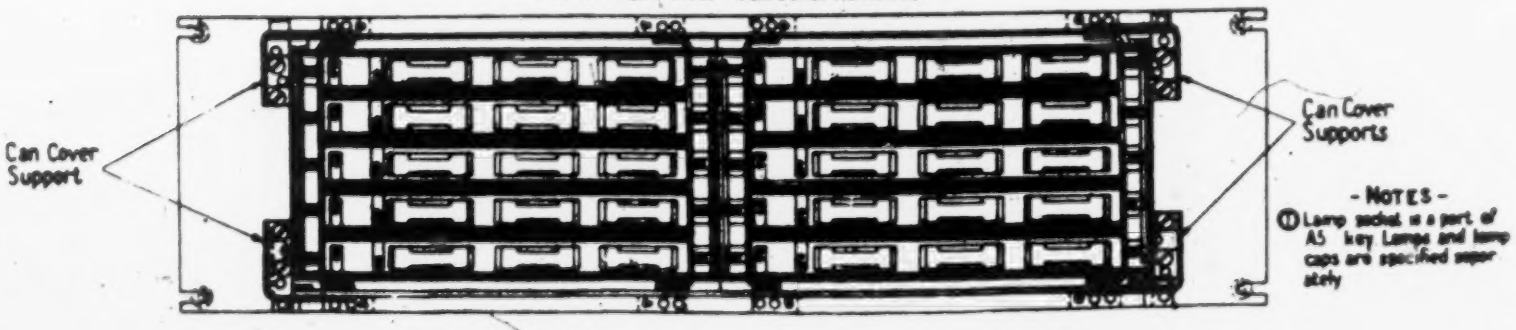


FIG 3 · Rear View · Can Cover Removed



- NOTES -
① Lamp socket is a part of A5 key Lamps and lamp caps are specified separately

15530

AMERICAN TELEPHONE & TELEGRAPH CO.
Department of
Development and Research

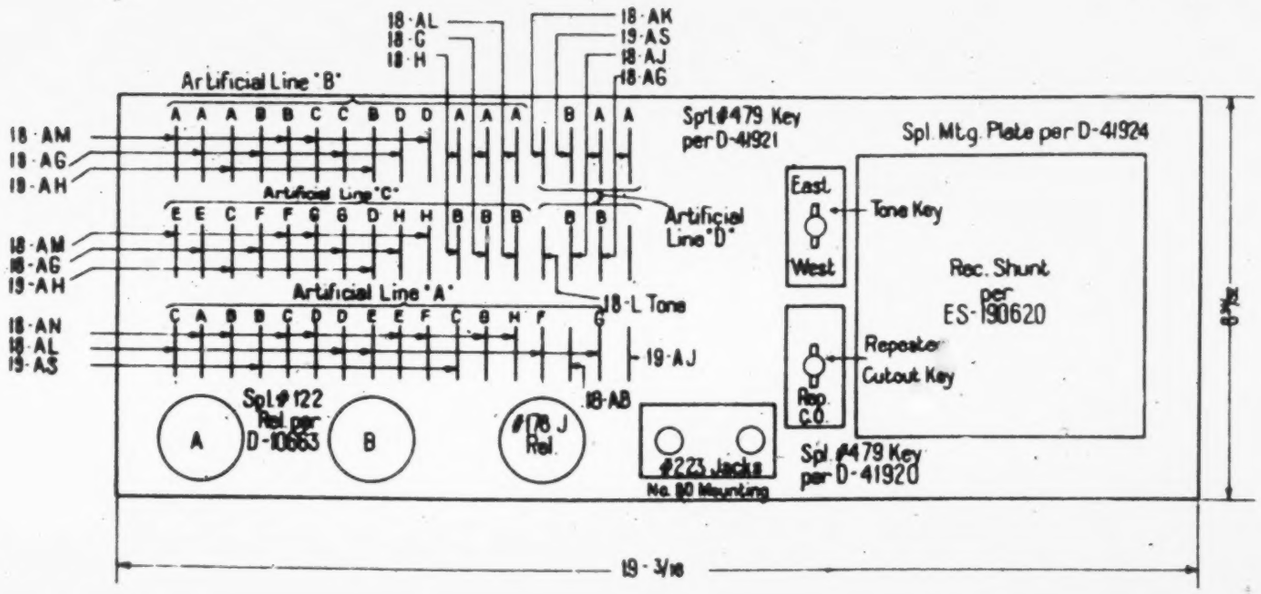
TELEPHONE REPEATER EQUIPMENT
TESTING CIRCUIT

For Testing "22" Type Telephone Repeaters
Assembly of Apparatus

192-B-9
Standard
Replacing 704-897

Engineer
Draftsmen
Checked by
Log No. P-4710-B-2520
ISSUE 1

Was Provisional
Made Standard
Log No. S-4344 11-1-22
ISSUE 2



15531

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
TELEPHONE SET AND RING DOWN TRUNK
Assembly of Apparatus at Relay Rack

192-B-10
Standard

Engineer
Draftsman
Checked by
Redrawn - Apparatus rearranged
Log No. P 7884 4-7-22
ISSUE 2

Was Provisional
Made Standard
Log No. 9438 11-1-22
ISSUE 3

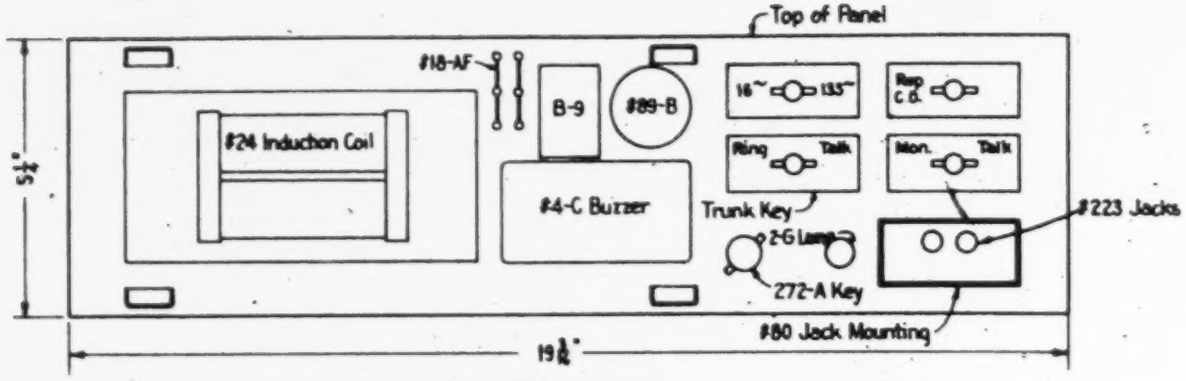


Fig 1
Front View

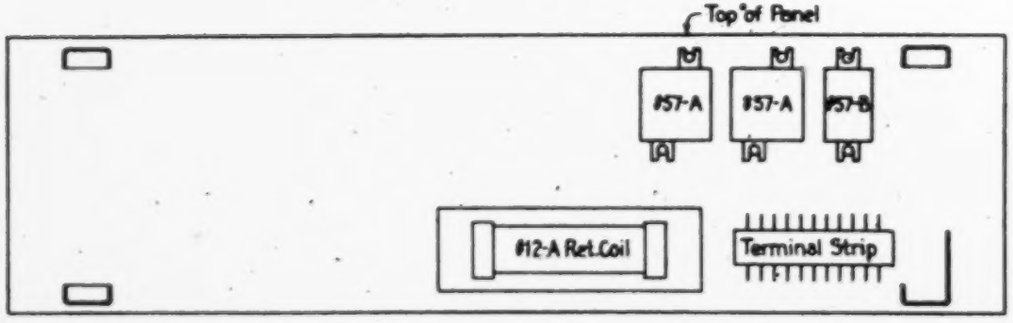


Fig 2
Rear View

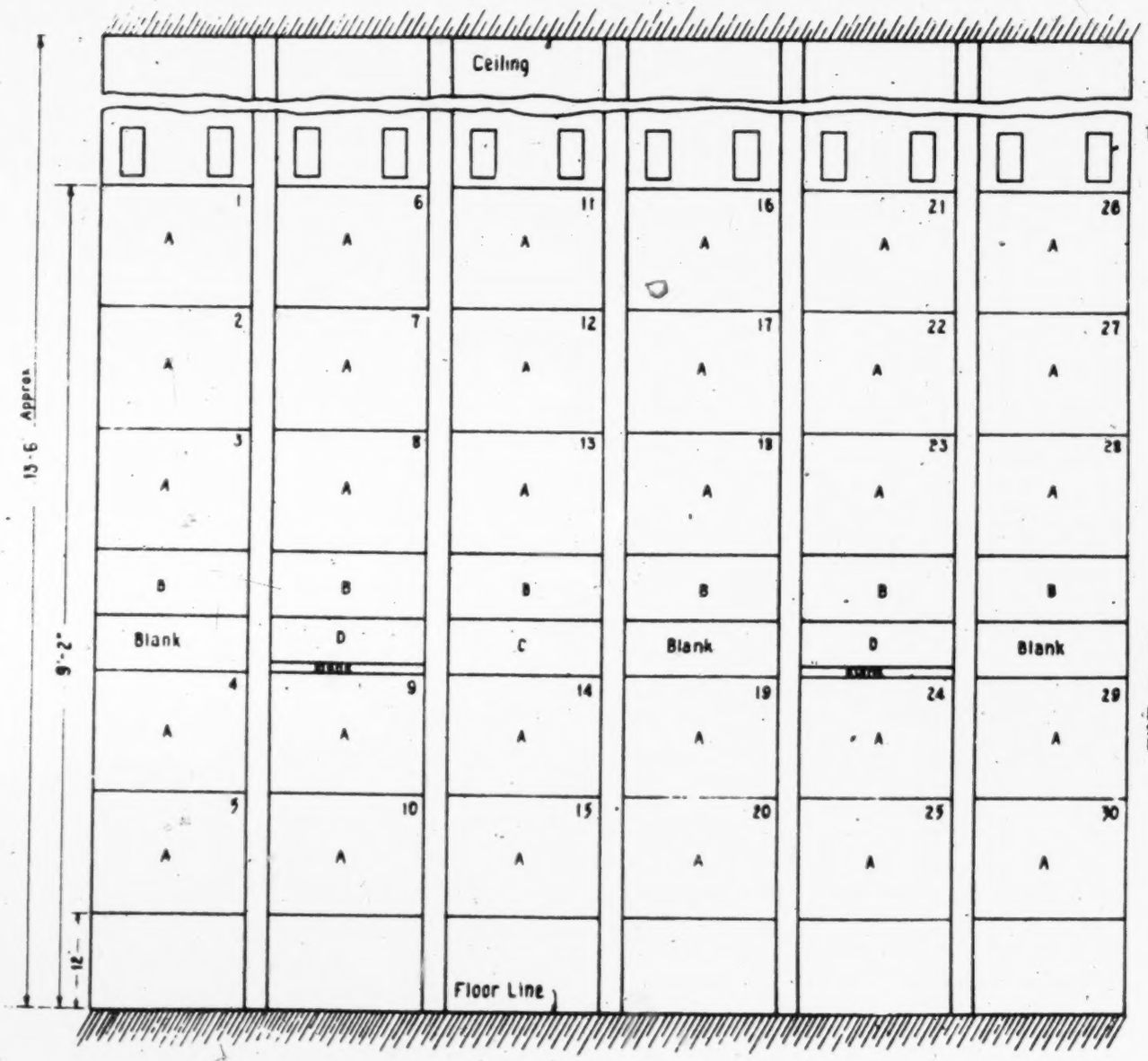
15532

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
22 TYPE REPEATER SETS
Typical Arrangement of Repeater Sets and Associated Equipment at the Relay Rack

192-B-11
Standard
Replacing 704-896

Engineer
Draftsman
Checked by
Made Standard 11-1-22
Log No. R4706 8.25.20
ISSUE 1
Was Provisional. Made Standard. Repeaters numbered from bottom up. Height of apparatus in bay was 8'-10½".
Log No. S-4706. 11-1-22
ISSUE 2



NOTES

A - Repeater Set per 187-B x-5
B - Repeater Jack Panel per 158-B-18
C - Testing Circuit per 192-B-9
D - Telephone Set & Trunk Cct per 328-B-10

No. of repeaters mounted in a bay shall be governed by the ceiling height and shall be as specified.

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT

BATTERY SUPPLY CIRCUITS

Typical Arrangement of Apparatus at Relay Rack
For Offices where Battery Supply Equipment is located at separate Relay Rack Bays

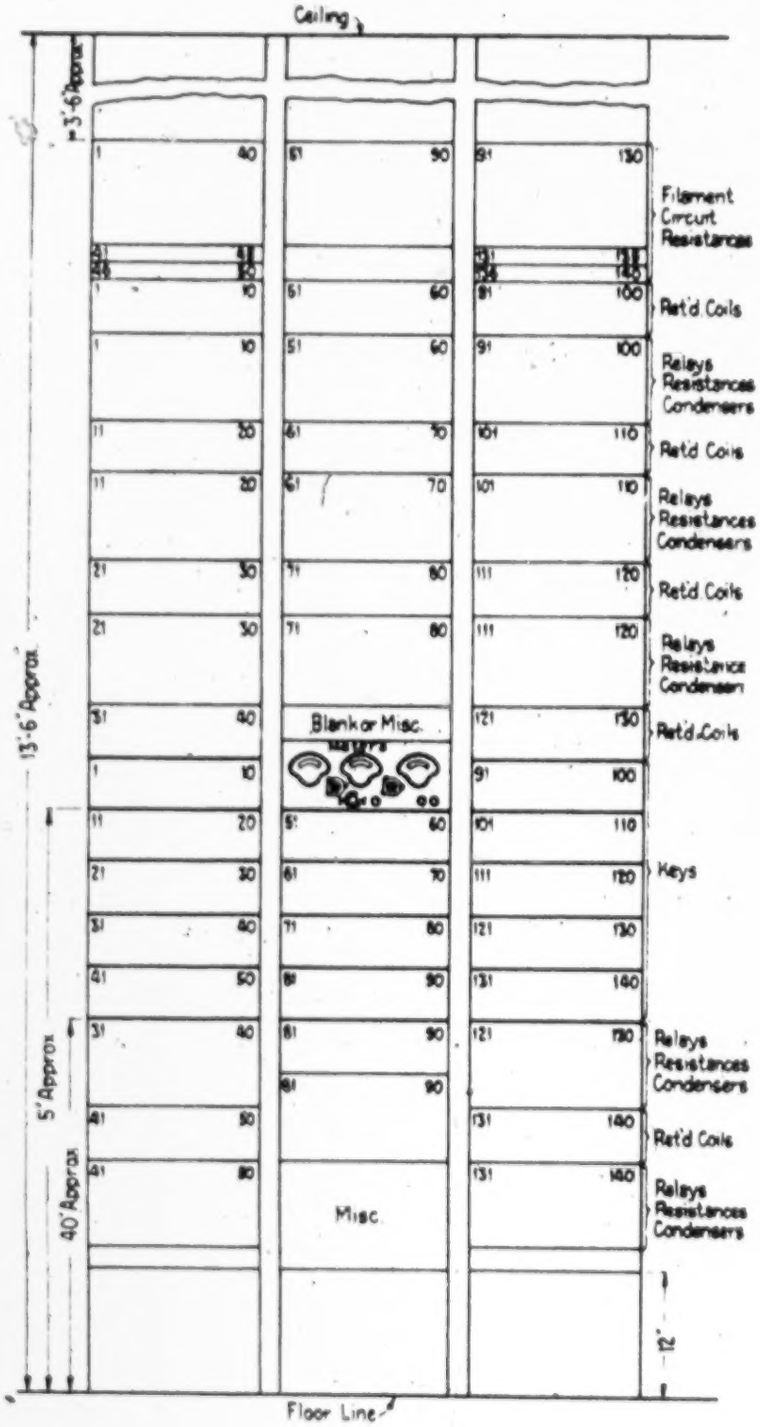
192-B-32
Standard
Replacing 192-B-32 of 12/2/20

Engineer
Draftsman
Checked by

Redrawn - Equipment rearranged. Removed reference to master keys.

Log No. P-7509 4/7/22.
ISSUE 2

Was provisional Made standard.
Log No. S-42868 10-30-22
ISSUE 3



- NOTES -

1. One set of Meters shall be provided for each 3 bays of battery supply equipment and shall be located in the central bay. The meter panel should not be less than 4 feet or more than 6 feet above the floor.
2. When automatic regulating circuits are provided, the necessary relays, resistances etc., shall be located at the relay rack along with the rest of the battery supply equipment.
3. One set of meters may be used for both 22 type and four wire battery supply circuits. Battery supply circuits for both 22 type and four-wire repeaters may be located in the same bay if desirable in order not to require an additional relay rack bay.
4. Filament circuit ground leads need not be looped in horizontal cable form.

15534

9562

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
AUTOMATIC FILAMENT CURRENT REGULATING CIRCUIT
For Use in 24 or 38 Volt Offices

196-B-30
Standard

Engineer B.O.D.
Draftsman
Checked by J.[illegible]
Log No. 3-3683-31-22
ISSUE 1
Added Fig. 4
Log No. S-4226 10-21-22
ISSUE 2

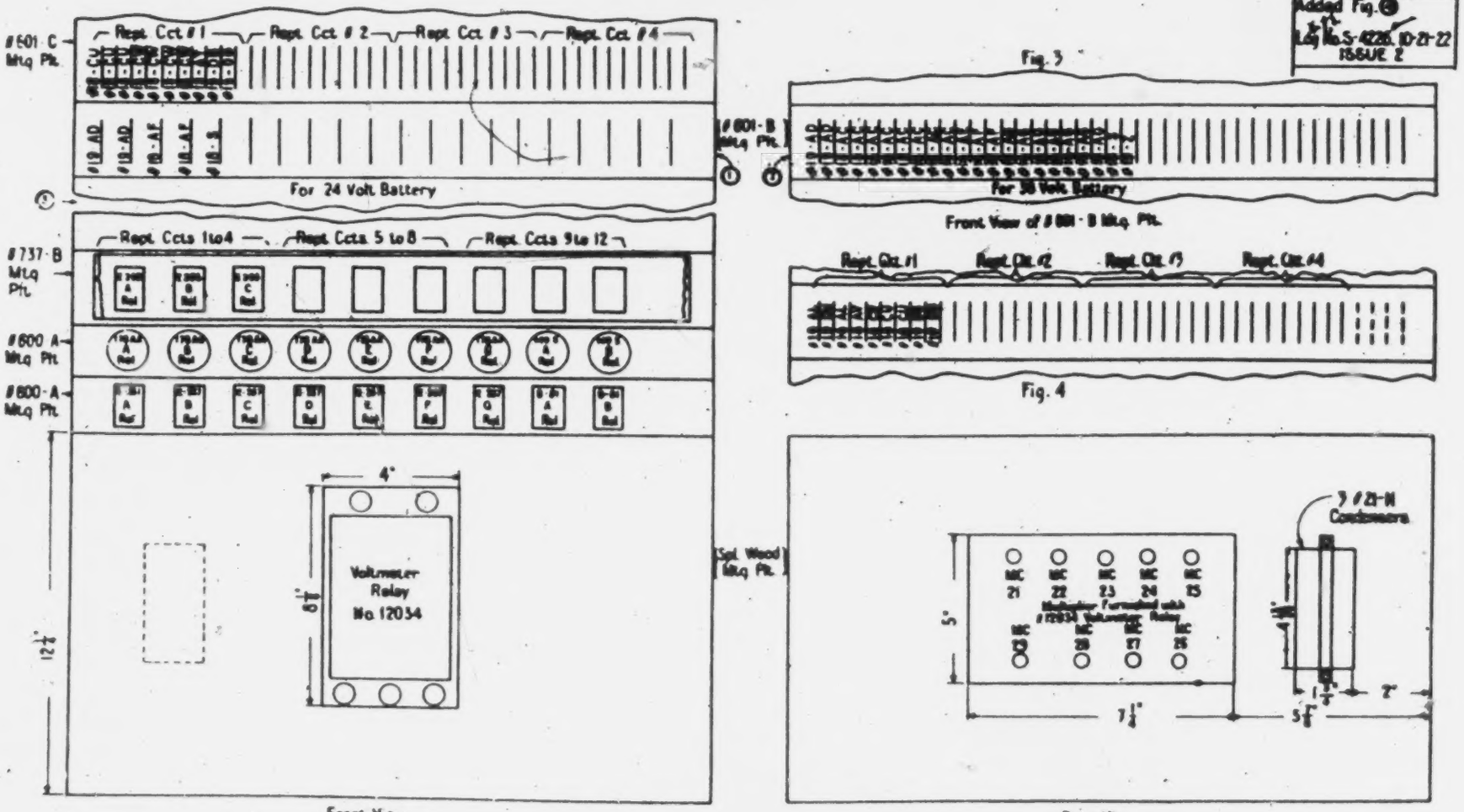


Fig. 3

Front View of #601-B Mtg. Pls.

Fig. 4

Front View
Fig. 1

Rear View
Fig. 2

NOTES

No magnetic material shall be mounted within three inches of the voltmeter relay

① Use this strip in 24 volt offices

② Substitute this strip in 38 volt offices

③ Reserve space for sufficient relay mounting plates to care for ultimate number of repeater not to exceed 400 repeaters.

④ Fig. 4 shows filament circuit resistances where filament current limits are .94 to 1.0 amperes.

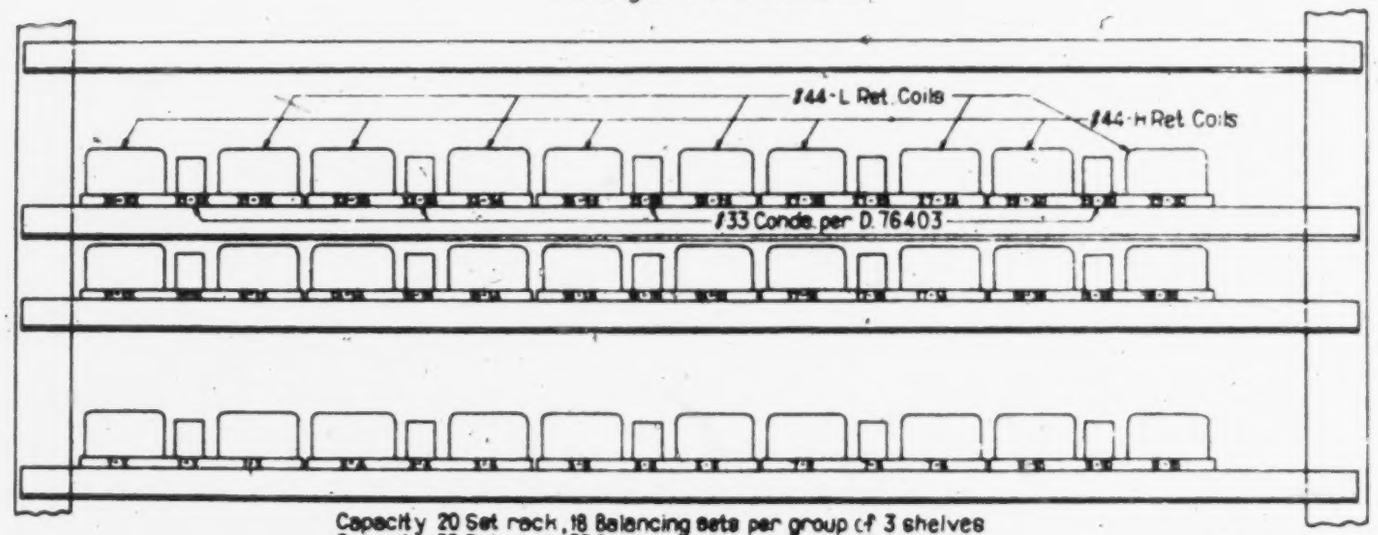
AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
METALLIC COMPOSITE BALANCING SETS
Arrangement at Composite Rack

196-B-57
Standard

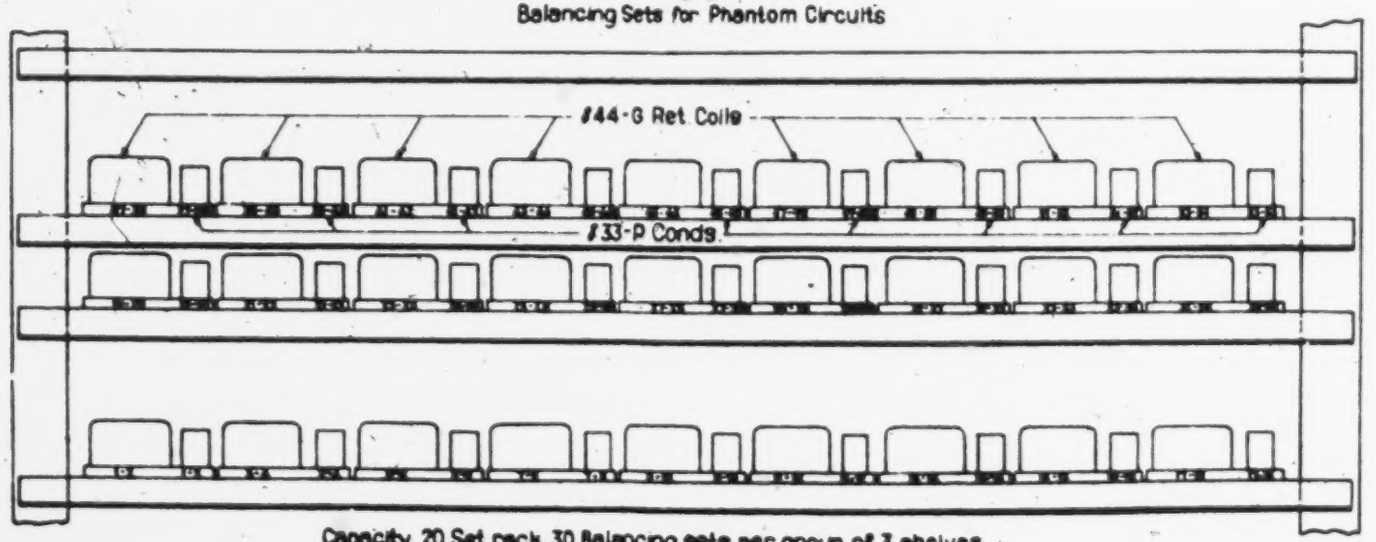
Engineer
Draftsman
Checked by
Log No. P-7439-4/3/22
ISSUE 1
Was Provisional Made Standard
Log No. S-4317-11-1-22
ISSUE 2

FIG. 1
Balancing Sets for Side Circuits



Capacity 20 Set rack, 18 Balancing sets per group of 3 shelves
Capacity 30 Set rack, 30 Balancing sets per group of 3 shelves

FIG. 2
Balancing Sets for Phantom Circuits



Capacity 20 Set rack 30 Balancing sets per group of 3 shelves
Capacity 30 Set rack 54 Balancing sets per group of 3 shelves

15536

AMERICAN TELEPHONE & TELEGRAPH CO
Department of
Development and Research

TELEPHONE REPEATER EQUIPMENT
REPEATER JACK PANEL
Assembly of Jacks at Relay Rack
For Reading Type Two Wire Repeaters.

199-B-19
Standard
Replacing 192-B-17

Engineer
Draftsman
Checked by
Leg No. 54300 11-1-22
ISSUE 1
Leg No. 54811 4-22-23
ISSUE 2

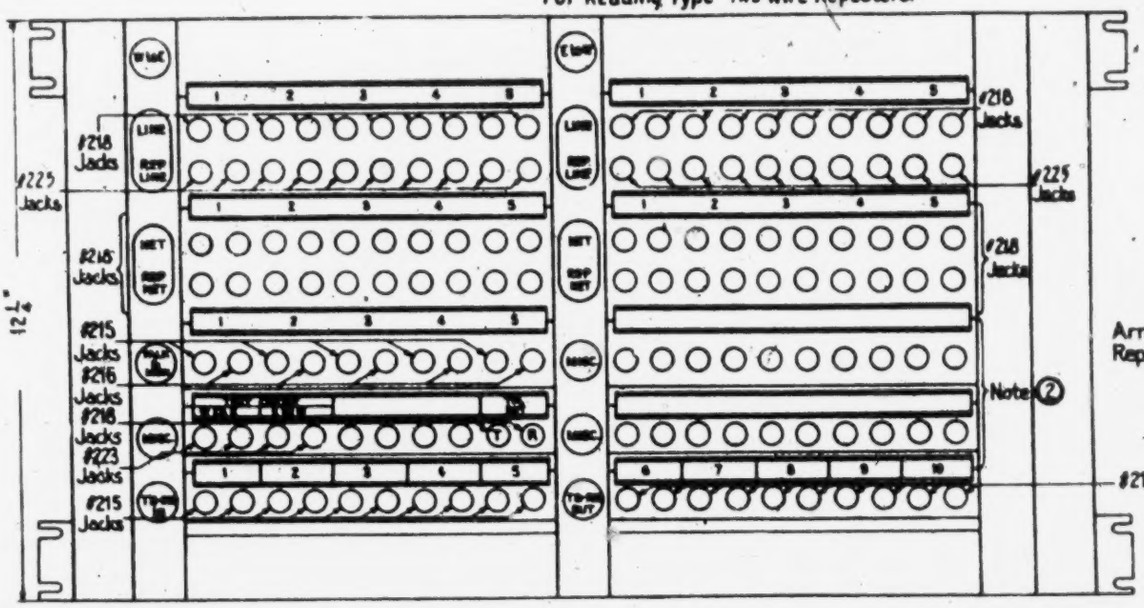


FIG. 1
Arrangement for Five Repeaters per Bay

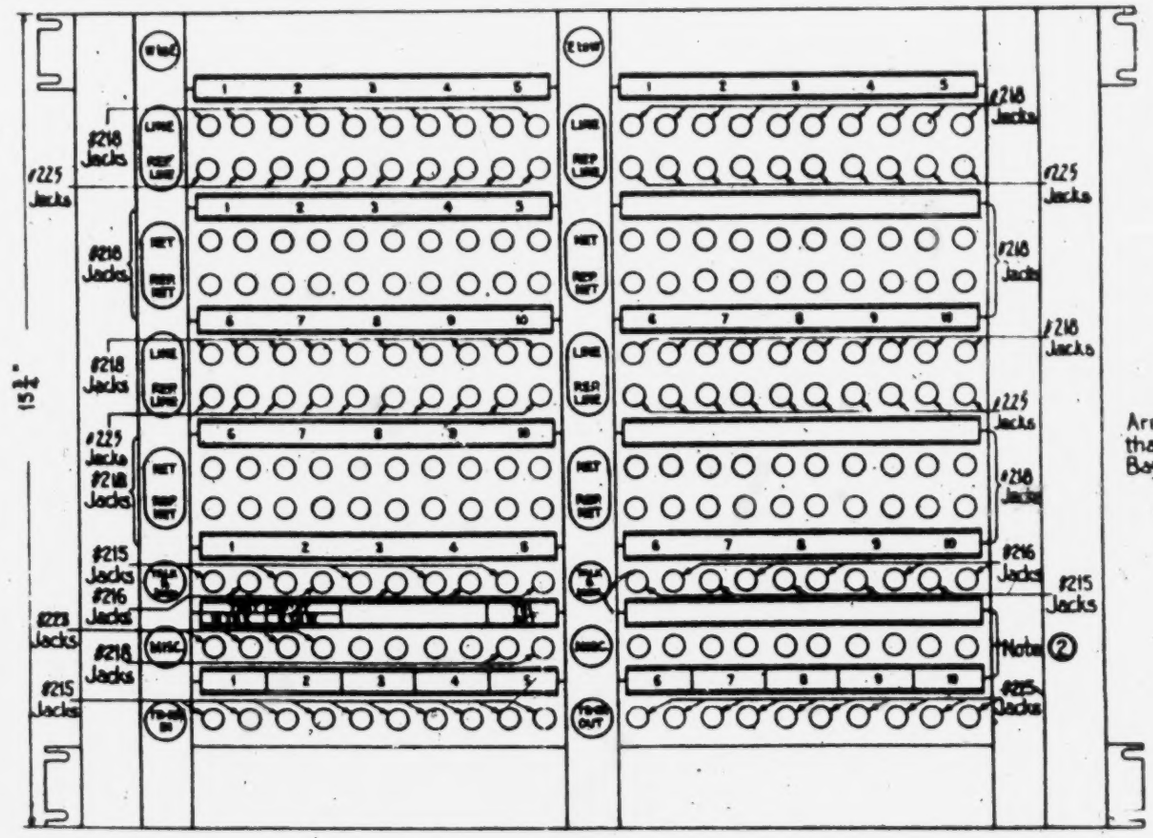


FIG. 2
Arrangement for more than Five Repeaters per Bay

NOTES

① Double Jack Mountings are #129; Single Jack Mountings are #128; Oval number plates are #127-A; Round number plates are #23-D; Designation strips are #8-K.

② When miscellaneous jacks in right hand panels are not required, substitute #60-A jack spaces for the #128 jack mounting

15537

9565

[fol. 15538] TOLL CASE—KOSITZKY EXHIBIT No. 26

A. U. R. P. No. 124

The Ohio Bell Telephone Company

Services rendered to The Ohio Bell Telephone Company by the General Staff of the American Telephone and Telegraph Company.

Summary of letters received by The Ohio Bell Telephone Company from the American Telephone and Telegraph Company, and telephone conversations between representatives of both companies.

Classification	Letters Received	Telephone Conversations
1. General	220	1
2. Fundamental Plans	12	5
3. Land and Buildings	30	
4. Commercial	269	60
5. Central Office Equipment	185	5
6. P. B. X. Equipment & Substations	134	1
7. Outside Plant	106	8
8. Transmission	180	37
9. Traffic	393	113
10. Motor Vehicles & Supplies	97	
11. Tools	31	1
12. Unification	29	1
13. First Aid	12	
14. Arrangements with other wire using companies	7	
15. Depreciation	3	
16. Inventories, Appraisals & Valuations	3	
17. Forms	9	3
Total	1720	235

86½% of the above letters is in connection with specific problems of The Ohio Bell Telephone Company. The remaining 13½% is general in nature, affecting several associated companies. All of the telephone conversations, of course, are in connection with specific problems of The Ohio Bell Telephone Company.

[fol. 15539] TOLL CASE—KOSITZKY EXHIBIT No. 28

A. U. R. P. No. 124

The Ohio Bell Telephone Co.

Services rendered to The Ohio Bell Telephone Company by the General Staff of The American Telephone and Telegraph Company.

Summary of special services rendered to The Ohio Bell Telephone Company by members of the General Staff of the American Telephone and Telegraph, involving trips to Ohio by the latter and trips to New York by members of The Ohio Bell Telephone Company organization.

Classification	Number of Services
1. General	37
2. Fundamental Plans	11
3. Land and Buildings	8
4. Commercial	168
5. Central Office Equipment	36
6. P. B. X. Equipment and Substations	19
7. Outside Plant	20
8. Transmission	58
9. Traffic	178
10. Motor Vehicles & Supplies	13
11. Tools	6
12. Unification	18
13. Depreciation	4
14. Inventories, Appraisals & Valuations	1
Total	577

97½% of the above services is in connection with specific problems of The Ohio Bell Telephone Company. The remaining 2½% is general in nature, affecting several associated companies.

[fol. 15540] TOLL CASE—KOSITZKY EXHIBIT No. 30

A. U. R. P. No. 124

The Ohio Bell Telephone Company

Services Rendered to the Ohio Bell Telephone Company by the General Staff of The American Telephone and Telegraph Company

Instrument Service

1. First Cost: Set of Instruments		$4.50
2. Annual Cost per Set of Instruments		21%
3. Average Number of Sets of Instruments per station		1.05
4. Annual Cost per station (except stock of instruments to ensure continuity of supply) 4.50 × 21% × 1.05=		$0.992
5. Stock of Instruments to Ensure Continuity of Supply = 6% additional per station = 6% of $4.50 =		$0.270
6. Annual Cost of Carrying this Stock 11%		
7. Annual Cost per station on those carried in Stock, = $0.270 × 11% =		$0.03
8. Total Annual Cost per Station		$1.022
9. Average number of sets of Instruments	519,622	
10. Number of stations (Dec. 31, 1923)	495,397	
11. Total First Cost Evaluation of the Instrument Service = 519,622 × 1.06 × 4.50=		$2,478,597
12. Total Annual Value of Instrument Service to The Ohio Bell Telephone Company — 495,397 × 1.022=		$506,296

[fol. 15541] TOLL CASE—KOSITZKY EXHIBIT No. 31

A. U. R. P. No. 124

The Ohio Bell Telephone Company

Estimated Savings for The Ohio Bell Telephone Company Due to Certain Items of Development Work Carried Out by The General Engineering Staff of The American Telephone and Telegraph Company

Exchange

Item	Saving in First Cost	Saving in Annual Charges
1. Fine Wire Cables (Excepting 900 pair, 22 gauge and all sizes 24 gauge cable) including ducts	$9,414,788	$1,554,148
2. 900 Pair 22 gauge, and all sizes 24 gauge cables, including ducts	1,323,699	198,208
3. Lead-Antimony Cable Sheath	271,100	38,368
4. Copper-Steel Twisted Pair Wire	1,208,670	374,688
5. Duplex Cable	31,121	4,886
6. Loading (Inter office trunks) including ducts	3,685,722	517,843
7. Machine ringing on "B" Boards	224,000	267,377
8. Prepay Coin Box Equipment		139,031
9. Improved Local Switchboard Cords		249,906
10. Improved Line and Cut-off Relays	125,028	27,882
11. Cheaper Contact Metal	370,080	68,465
Total	16,654,208	3,440,802

[fol. 15542] TOLL CASE—KOSITZKY EXHIBIT No. 32

A. U. R. P. No. 124

The Ohio Bell Telephone Company

Estimated Savings for The Ohio Bell Telephone Company Due to Certain Items of Development Work Carried Out by The General Engineering Staff of The American Telephone and Telegraph Company

Toll

Item	Saving in First Cost	Saving in Annual Charges
1. Lead Antimony Cable Sheath	$17,945	$2,473
2. Copper Steel Twisted Pair Wire	923	286
3. Duplex Cable	709,563	105,183
4. Loading (open wire and toll cables without repeatered circuits), including ducts	820,171	137,311
5. Open Wire Phantom Circuits	7,601,774	1,453,485
6. Repeaters	736,110	104,828
7. Single Ticket Method of Toll Operation	736,409	570,206
8. Overlap Ringing-in Toll Operation	149,297	58,458
9. Improved Toll Switchboard Cords		15,842
10. Improved Line and Cut-Off Relays	7,981	1,780
11. Cheaper Contact Metal	23,622	4,370
Total	10,803,795	2,454,222

[fol. 15543] TOLL CASE—KOSITZKY EXHIBIT No. 33

A. U. R. P. No. 124

The Ohio Bell Telephone Company

Estimated Savings for The Ohio Bell Telephone Company Due to Certain Items of Development Work Carried Out by the General Staff of the American Telephone and Telegraph Company and the Value of the Instrument Service to The Ohio Bell Telephone Company

Summary

Item	Saving in First Cost	Saving in Annual Charges
Exchange—Including Instrument Service	$19,132,805	$3,947,098
Toll	10,803,795	2,454,22
Total — Not including anything for legal, financial, accounting, use of patents, etc.	$29,936,600	$6,401,320

(Here follows 1 photo, side folio 15544)

ADVISO
AI

DEPARTMENT OF DEVELOPMENT AND RESEARCH

CONDUCTS DEVELOPMENT AND RESEARCH in connection with new systems, apparatus and materials for use in plants of Associated Companies.

This work is undertaken in advance of needs of Associated Companies, so that orderly expansion of their business will not be choked and they will not be obliged to enter upon use of untried systems, apparatus and materials.

Preventing errors by Associated Companies from use of improper apparatus, materials or practices.

Examining Current Technical literature of the World in search of useful new ideas.

Examination of Patents issued bearing, in any way, on art of telephony.

Investigating and Testing general scientific and engineering discoveries.

Recommends standards. Uniform practices contribute to economy in production and operation. Telephone plant is a constantly growing thing. Specifications, apparatus and methods must be frequently reviewed to see that they stand the test that each day applies to them. Standards must be dynamic, not static.

[illegible] the lines of development

LEGAL DEPARTMENT

EXPERT ADVICE as to all questions arising in connection with the business.

ADVANCE COMPILATION AND DISTRIBUTION OF REPORTS of all commission decisions.

BULLETIN OF COURT CASES of interest to Associated Company:- Compilation and distribution at regular intervals.

COLLECTION, ANALYSIS & DISTRIBUTION of INFORMATION of general interest and value to legal departments of Associated Companies.

PREPARATION & DISTRIBUTION OF COMPARATIVE COMPILATIONS of all statutes affecting telephone companies.

USE OF PATENTS

Large number of patents owned and controlled by A. T. & T. Co.

These patents cover system Associated Companies now use. Also methods to be used in future.

Groups of these patents cover matters of vital consequence in economy and efficiency of apparatus used by Associated Companies.

ACCOUNTIN

AUDITING ACCOUNTS OF Associated Company

ACCOUNTING STANDARDIZATION

DEVELOPING AND MAINTAINING UNIFORM ACCOUNTING SYSTEM

DEVISING FORMS AND ROUTINES of Clerical Procedure.

CONFERENCES with Interstate Commerce and other Commissions.

Development and [illegible] of statistical collection of [illegible]

Determines the lines of development work to meet the requirements, present and future, of the Bell System. Conducts and directs the development and research work covering the entire technical field of telephony.

DEVELOPMENT, RESEARCH AND STANDARDIZATION

APPARATUS

SUBSTATION EQUIPMENT

Desk Stands
Ringers
Cords
Wiring Arrangements.

INSTRUMENTS:

TRANSMITTERS, RECEIVERS, INDUCTION COILS

Improving the loudness and clearness.

SWITCHBOARDS AND EQUIPMENT

MANUAL

CIRCUITS AND APPARATUS

Local Switchboards and Equipment
Toll Switchboards and Equipment
Private Branch Exchanges
Power Supply
Test Boards
Desk Equipment
Maintenance Methods

MACHINE SWITCHING

CIRCUITS AND APPARATUS

Panel Machine Switching.
Improvement of existing machine switching systems for use in

OUTSIDE PLANT

Cables of all kinds including duplex cables.
Phantom circuits.
Poles, crossarms, other timber and preservatives.
Subway materials.
Pole line hardware.
Outside plant apparatus of all kinds.
Wire and strand.
Tools
Prevention of electrolysis.

TELEPHONE TRANSMISSION

Improving the loudness and clearness of telephone transmission.
Advanced scientific research applied to telephone art.
Telephone Repeaters.
Application of loading to cables and open wires.
Carrier and Radio systems.
Electrical protection.
Transmission measuring devices.

PREVENTION OF INTERFERENCE FROM ELECTRIC LIGHT, ELECTRIC RAILWAY & POWER LINES AND OTHER SOURCES.

Development of:
Transposition systems, Electrically balanced apparatus; Safe construction methods for crossings, parallels, and jointly used lines.

These patents cover system Associated Companies now use. Also methods to be used in future.

Groups of these patents cover matters of vital consequence in economy and efficiency of apparatus used by Associated Companies.

Several of these groups cover, broadly and in detail, apparatus, methods, systems and connections required in improving transmission of speech.

A large group covers ground we must traverse in prospective developments of switchboards.

A. T. & T. Co. patent department assumes burden of patent litigation and obtains adequate patent protection on new developments.

A. T. & T. Co. assumes responsibility for claims for infringement and all concern with patent matters of any kind.

Development and st
of statistical met
collection of stat
ing to telephone
and elsewhere.

PLANT ENGINEERING

In order that plants may be most economically designed, constructed and
Associated Companies are advised as to
types of construction best suited
different conditions and having
nace between investment and
costs.

Buildings:

This department prepares efficient and economical floor plans for buildings; participates in planning new buildings and extensions to existing buildings; advises as to desirable size and shape of land for specific building projects; advises as to fire prevention and protection and other building safety measures; al o regarding maintenance of buildings.

Central Office Engineering:

When additions to the plant are required it is often possible to provide the additional facilities by more than one plan of procedure. This Department is frequently called upon by Associated Companies to revise their studies made to determine the most economical plan and to make suggestions.

Prepares and issues to Associated
panies information covering best
of maintaining central office

DEVELOPMENT, RESEARCH AND STANDARDIZATION

A. T. & T. Co. patent department assumes burden of patent litigation and obtains adequate patent protection on new developments.

A. T. & T. Co. assumes responsibility for claims for infringement and all concern with patent matters of any kind.

APPARATUS

SUBSTATION EQUIPMENT

Desk Stands
Ringers
Cords
Wiring Arrangements.

INSTRUMENTS:

TRANSMITTERS, RECEIVERS, INDUCTION COILS

Improving the loudness and clearness.

SWITCHBOARDS AND EQUIPMENT

MANUAL

CIRCUITS AND APPARATUS

Local Switchboards and Equipment
Toll Switchboards and Equipment
Private Branch Exchanges
Power Supply
Test Boards
Desk Equipment
Maintenance Methods

MACHINE SWITCHING

CIRCUITS AND APPARATUS

Panel Machine Switching.
Improvement of existing machine switching systems for use in smaller places.
Machine switching in connection with manual offices.
Substation and private branch exchange arrangements for use with machine switching.
Maintenance methods.

OUTSIDE PLANT

Cables of all kinds including duplex cables.
Phantom circuits.
Poles, crossarms, other timber and preservatives.
Subway materials.
Pole line hardware.
Outside plant apparatus of all kinds.
Wire and strand.
Tools
Prevention of electrolysis.

TELEPHONE TRANSMISSION

Improving the loudness and clearness of telephone transmission.
Advanced scientific research applied to telephone art.
Telephone Repeaters.
Application of loading to cables and open wires.
Carrier and Radio systems.
Electrical protection.
Transmission measuring devices.

PREVENTION OF INTERFERENCE FROM ELECTRIC LIGHT, ELECTRIC RAILWAY & POWER LINES AND OTHER SOURCES.

Development of:
Transposition systems, Electrically balanced apparatus; Safe construction methods for crossings, parallels, and jointly used lines.

PLANT ENGINEERING

In order that plants may be most economically designed, constructed and maintained Associated Companies are advised as to types of construction best suited to different conditions and having best balance between investment and maintenance costs.

Buildings:

This department prepares efficient and economical floor plans for buildings; participates in planning new buildings and extensions to existing buildings; advises as to desirable size and shape of land for specific building projects; advises as to fire prevention and protection and other building safety measures; also regarding maintenance of buildings.

Central Office Engineering:

When additions to the plant are required it is often possible to provide the additional facilities by more than one plan of procedure. This Department is frequently called upon by Associated Companies to review their studies made to determine the most economical plan and to make suggestions.

Prepares and issues to Associated Companies information covering best methods of maintaining central office equipment.

Substation Engineering:

Associated Companies are furnished latest and best information as to design, installation and maintenance of substation and private branch exchange circuits and as to installation and maintenance practices for substation equipment.

Methods for making fundamental development studies based on surveys, and assistance in

TOLL CASE RHODES EXHIBIT 3

TABULAR VIEW OF LICENSE CONTRACT SERVICES

ADVISORY, CONSULTING, FINANCIAL AND GENERAL SERVICES

ACCOUNTING DEPARTMENT

- AUDITING ACCOUNTS OF Associated Company
- VISITS to Associated Company GIVING ADVICE on Accounting Matters.
- ACCOUNTING STANDARDIZATION
- DEVELOPING AND MAINTAINING UNIFORM ACCOUNTING SYSTEM
- DEVISING FORMS AND ROUTINES of Clerical Procedure.
- CONFERENCES with Interstate Commerce and other Commissions.
- STATISTICAL ADVICE
- Studies of financial and general business conditions for benefit of Associated Companies.
- Cooperating with and assisting Associated Companies in statistical work and studies of expected future operating results.
- Actuarial studies involving subjects such as insurance matters, pension plans, etc.
- Development and standardization of statistical methods, and collection of statistics pertaining to telephone business in U.S. and elsewhere.

EXECUTIVE DEPARTMENT AND TREASURER'S DEPARTMENT

Assistance in Raising Funds for Plant Extensions as per Budget:

(a) Loaning money at ordinary rates of interest.
(b) Taking stock without discount.
(c) Assisting in sale of securities

- STUDIES AND ADVISES Associated Companies on PLANT, TRAFFIC and COMMERCIAL problems Effecting the construction, operation and development of their telephone systems.
- DETERMINES MOST EFFECTIVE METHODS for Associated Companies: Studies and compares their results. Recommends improvements in service, economies and better arrangements of working organizations to meet conditions in the field.
- Specifications, Handbooks and Circular Letters
- FURNISHES to Associated Companies CONSULTING ENGINEERING ADVICE on unusual or difficult or exceptionally large engineering questions.
- SPECIFIC WORK DONE FOR EACH ASSOCIATED COMPANY
- Large amount of work done by General Engineering Staff in advisory capacity on Specific Engineering questions. The engineers of the Associated Companies call upon the General Engineering Staff for specific advice and assistance whenever in their opinion they require it.

DEPARTMENT OF OPERATION AND ENGINEERING

- Advises Managing Officials of Associated Companies on Operating and Engineering features of telephone business to secure most satisfactory service to Public and greatest economy of operation.

...with Inter-...ate Commerce and other ...missions.

Actuarial studies involving subjects such as insurance matters, pension plans, etc.

Specifications, Handbooks and Circular Letters

General Engineering Staff for specific advice and assistances whenever in their opinion they require it.

Development and standardization of statistical methods, and collection of statistics pertaining to telephone business in U.S. and elsewhere.

PLANT

TRAFFIC ARRANGEMENTS

Simple, effective and economical.

TRAFFIC

Best methods of handling all classes of calls.
Most effective and economical handling of traffic work.
Best ways of giving efficient and economical service to meet the needs of the Public.
Standard traffic engineering and operating bulletins prepared and furnished to Associated Companies.
Service and traffic work of all Associated Companies carefully studied.
Advice given to Associated Companies on special traffic problems and difficulties.

PLANT ENGINEERING

PLANT OPERATION

...hat plants may be most economic-...gned, constructed and maintained. ...d Companies are advised as to ...construction best suited to meet ... conditions and having best bal-...een investment and maintenance

Outside Plant:

Illustrated handbooks are prepared giving plant forces detailed information as to best construction and maintenance practices to follow in all portions of outside plant including conduits, underground cables, aerial cables, pole lines and wire plant.

Associated Companies furnished information as to most approved methods of making engineering cost comparisons to determine most economical types and sizes of outside plant to install under various conditions as to expected future rate of growth.

Development work to make available to Associated Companies labor saving machines for use in outside plant construction work, such as pole hole diggers, pole derricks, etc.

Plant Practices and Results

Development of most effective methods of planning and executing construction and maintenance work.

Study and analysis of construction and maintenance practices and results; study of force requirements.

Operating Practices and Results

Providing Associated Companies with operating routines and records best adapted to secure efficiency in methods of plant operation.

Accident Prevention

Analysis of accident reports of Associated Companies enables causes of accidents to be eliminated in design of plant and methods of working, thereby reducing accidents to a minimum.

Assistance to Associated Companies in preparation of Employees' Safety Codes.

LOCAL:

Type, quantity and arrangement of equipment to render best and most economical local exchange service.

Conducting investigations and trials of new apparatus and methods designed to improve service or render it at lower cost.

Preparing for Associated Companies descriptions of best methods and practices to be employed by operating forces.

Developing traffic engineering methods used by Associated Companies for determining proper amounts and arrangements of local switchboard equipment under different conditions.

Developing fundamental traffic engineering records to provide data necessary for engineering buildings, switchboards and arrangement of the operating forces.

TOLL:

Type, quantity and arrangement of switchboard equipment for toll offices; quantity and arrangement of toll line circuit facilities and best toll operating methods and practices.

Developing traffic engineering methods used by Associated Companies for determining proper amounts and arrangements of toll switchboard equipment under different conditions.

Developing fundamental traffic engineering records to provide data necessary for estimating future toll equipment and toll circuit requirements.

Determining basic toll circuit loads and most economical arrangements for use in toll line engineering work.

Conducting investigations and trials of new apparatus and methods designed to improve toll service or to render it at lower cost through more

GENERAL TRAFFIC PROBLEMS:

Development of methods for making fundamental plans for toll plants and assistance to Associated Companies in making such plans.

Development of toll rate quoting and rate computing methods and means to enable toll operators to determine correct charges on toll calls with least delay and effort.

PLANT

PLANT ENGINEERING

...der that plants may be most economic-
...designed, constructed and maintained.
...iated Companies are advised as to
...e of construction best suited to meet
...erent conditions and having best bal-
...between investment and maintenance
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... prac-

...or making fundamental plans and
...nt studies based on commercial
... and assistance in specific plans.

Outside Plant:

Illustrated handbooks are prepared giving plant forces detailed information as to best construction and maintenance practices to follow in all portions of outside plant including conduits, underground cables, aerial cables, pole lines and wire plant.

Associated Companies furnished information as to most approved methods of making engineering cost comparisons to determine most economical types and sizes of outside plant to install under various conditions as to expected future rate of growth.

Development work to make available to Associated Companies labor saving machines for use in outside plant construction work, such as pole hole diggers, pole derricks, etc.

Transmission & Protection

Consulting advice on specific transmission matters; apparatus and methods for use in maintaining high grade transmission; methods and apparatus for electrical protection of telephone plant against hazards from power and lighting currents; best methods for minimizing interference with telephone transmission from induced currents from neighboring foreign circuits.

PLANT OPERATION

Plant Practices and Results

Development of most effective methods of planning and executing construction and maintenance work.

Study and analysis of construction and maintenance practices and results; study of force requirements.

Operating Practices and Results

Providing Associated Companies with operating routines and records best adapted to secure efficiency in methods of plant operation.

Accident Prevention

Analysis of accident reports of Associated Companies enables causes of accidents to be eliminated in design of plant and methods of working, thereby reducing accidents to a minimum.

Assistance to Associated Companies in preparation of Employees' Safety Codes.

Most effective methods of training employees in First Aid Work.

Requirements for First Aid Equipment.

...

Simple, effective and economical.

TRAFFIC

Best methods of handling all classes of calls.
Most effective and economical handling of traffic work.
Best ways of giving efficient and economical service to meet the needs of the Public.
Standard traffic engineering and operating bulletins prepared and furnished to Associated Companies.
Service and traffic work of all Associated Companies carefully studied.
Advice given to Associated Companies on special traffic problems and difficulties.

LOCAL:

Type, quantity and arrangement of equipment to render best and most economical local exchange service.

Conducting investigations and trials of new apparatus and methods designed to improve service or render it at lower cost.

Preparing for Associated Companies descriptions of best methods and practices to be employed by operating forces.

Developing traffic engineering methods used by Associated Companies for determining proper amounts and arrangements of local switchboard equipment under different conditions.

Developing fundamental traffic engineering records to provide data necessary for engineering buildings, switchboards and arrangement of the operating forces.

Developing best methods for engineering trunk layouts and equipments.

Type, arrangement and amount of information desk and other special equipment.

Operating problems arising in connection with cut-overs.

TOLL:

Type, quantity and arrangement of switchboard equipment for toll offices; quantity and arrangement of toll line circuit facilities and best toll operating methods and practices.

Developing traffic engineering methods used by Associated Companies for determining proper amounts and arrangements of toll switchboard equipment under different conditions.

Developing fundamental traffic engineering records to provide data necessary for estimating future toll equipment and toll circuit requirements.

Determining basic toll circuit loads and most economical arrangements for use in toll line engineering work.

Conducting investigations and trials of new apparatus and methods designed to improve toll service or to render it at lower cost through more efficient operating and more efficient use of the expensive toll plant.

Preparing for Associated Companies standard toll operating methods, and continuous work developing improved methods.

GENERAL TRAFFIC PROBLEMS

Development of methods for ...
...ing fundamental plans for ...
...plants and assistance to As...
...ciated Companies in making ...
...plans.

Development of toll rate quo...
...ing and rate computing meth...
...and means to enable toll op...
...ators to determine correct ...
...charges on toll calls with ...
...least delay and effort.

DEPARTMENT OF OPERATION AND ENGINEERING

Advises Managing Officials of Associated Companies on Operating and Engineering features of telephone business to secure most satisfactory service to Public and greatest economy of operation.

ADVISES ASSOCIATED COMPANIES regarding most effective methods of applying work of Department of Development and Research.

INSURANCE PROBLEMS.

- Standard Forms of Fire Insurance Policies.
- Buildings
  - Standard Types to Promote Safety and Reduce Fire Risk
  - Standards for Inspection and Maintenance.
  - Periodic Inspection of Buildings
- Rates and Adjustment of Losses.

TRAFFIC ARRANGEMENTS

Simple, effective and economical.

INFORMATION AND PUBLICITY DEPARTMENT

- Conducts National Advertising.
- Assists Associated Companies in their advertising.
  - Places advertising and publicity specialists at service of Associated Companies as required.

CONSISTING OF FU
ALL OF THE TRANS
COILS USED THERE
COMPANY FOR CIVI
PAIRING AND MAIN

Whenever a general improvement is made and a new type of instrument is brought out, the ASSOCIATED COMPANY can RETURN the INSTRUMENT OF THE OLDER TYPE and, without additional charge, OBTAIN INSTRUMENT OF THE LATEST TYPE.

Whenever the ASSOCIATED COMPANY returns an instrument for any injury whatsoever experienced as the result of its use it can OBTAIN A PERFECT INSTRUMENT IN EXCHANGE FOR IT: thus the Associated Company is relieved of the burden of repairing or replacing injured instruments.

COMMERCIAL

...FFIC ARRANGEMENTS

...le, effective and economical.

TRAFFIC

...handling all classes of calls. ...and economical handling of

...ving efficient and economical ...t the needs of the Public. ...c engineering and operating ...ared and furnished to Associated

...ffic work of all Associated ...fully studied. ... Associated Companies on special ...ms and difficulties.

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GENERAL TRAFFIC PROBLEMS:

Development of methods for making fundamental plans for toll plants and assistance to Associated Companies in making such plans.

Development of toll rate quoting and rate computing methods and means to enable toll operators to determine correct charges on toll calls with least delay and effort.

TRAFFIC RESULTS:

Development of means for measuring the quality and efficiency of traffic performance and of methods of traffic management and administration for securing best performance.

Equipment, methods and forms for observing both local and toll service.

Methods and forms for counting and recording the volume of traffic handled; for equating all classes of calls to a common work unit basis and for summarizing in useful form the data thus secured.

Continuous study of switchboard operation, both local and toll, as it is being carried on in the field, to determine and develop best operating technique for making effective the standardized operating practices.

Continuous study of all problems of central office management, such as are involved in the training and supervision of the operating forces, force adjustment work, etc.

COMMERCIAL

COMMERCIAL ADMINISTRATIVE PROBLEMS

COMMERCIAL ENGINEERING

COMMERCIAL METHODS AND RESULTS

Study and analysis of all phases of commercial administration and management with a view to assisting the Associated Companies in the establishment of the most effective organization and methods for rendering to the Public the most satisfactory and economical service.

Study and development of best forms of organization and equipment of business offices and most efficient routines for administration of business office work.

Studies and tests of business office supplies and appliances of every description, and standardization of types that best meet requirements of Associated Companies.

SALES METHODS

Study and analysis of the telephone service from the public viewpoint with the purpose of determining the most effective ways and means by which the Associated Companies may serve the interests of telephone users in all lines of business.

Studies of the various uses and applications of telephone service in order to determine and develop the most efficient methods and practices for its systematic and economic employment.

Associated Companies are furnished with information as to the best methods of analyzing service requirements of individual subscribers for the purpose of ascertaining what measures may be taken to increase the utility and efficiency of subscriber's telephone service.

DIRECTORY METHODS.

Study and analysis of directory problems with a view to assisting the Associated Companies in producing directories which shall be of the greatest possible use to the Public, taking advantage of all possible economies in production and distribution.

Studies are carried on relating to the scope and areas to be covered by directories, and to their frequency of issue.

Studies are made of methods of compilation, type styles, methods of listing, book specifications and delivery methods.

FORECASTING THE FUTURE

Associated Companies are furnished with the latest information as to the best methods of making Commercial Surveys to develop the telephone market and to determine the probable extent and direction of the growth of telephone service in order that plans may be made for adequate and economical extension of the plant.

Associated Companies are assisted in the making of specific commercial surveys.

RATE

Telephone rate ...ly studied wi... ...sisting the A... ...ies in the de... widest practi... telephone ser... ...lic, with the... the necessary...

Information f... as to rates ... ...tices is coll... ...lyzed, and s... ...mation are f... Associated C... matters.

Development ... of the Asso... of the funda... and princip... ...ing and of ... ...ing this in...

INSTRUMENT SERVICES

INFORMATION AND PUBLICITY DEPARTMENT

- Conducts National Advertising.
- Assists Associated Companies in their advertising.
  - Places advertising and publicity specialists at service of Associated Companies as required.

- ADVISES ASSOCIATED COMPANIES regarding most effective methods of applying work of Department of Development and Research.
- INSURANCE PROBLEMS.
  - Standard Forms of Fire Insurance Policies.
  - Buildings
    - Standard Types to Promote Safety and Reduce Fire Risk
    - Standards for Inspection and Maintenance.
    - Periodic Inspection of Buildings
  - Rates and Adjustment of Losses.

CONSISTING OF FURNISHING TO THE ASSOCIATED COMPANY ALL OF THE TRANSMITTERS, RECEIVERS AND INDUCTION COILS USED THEREWITH, REQUIRED BY THE ASSOCIATED COMPANY FOR GIVING TELEPHONE SERVICE, AND ALSO REPAIRING AND MAINTAINING THESE INSTRUMENTS.

- Whenever a general improvement is made and a new type of instrument is brought out, the ASSOCIATED COMPANY can RETURN the INSTRUMENTS OF THE OLDER TYPE and, without additional charge, OBTAIN INSTRUMENTS OF THE LATEST TYPE.
- CARRYING AN ADEQUATE RESERVE STOCK of instruments to assure Associated Company of uninterrupted supply.
- Whenever the ASSOCIATED COMPANY returns an instrument for any injury whatsoever experienced as the result of its use it can OBTAIN A PERFECT INSTRUMENT IN EX-
- The ASSOCIATED COMPANY is relieved from the

Whenever the ASSOCIATED COMPANY returns an instrument for any injury whatsoever experienced as the result of its use it can OBTAIN A PERFECT INSTRUMENT IN EXCHANGE FOR IT: thus the Associated Company is relieved of the burden of repairing or replacing injured instruments.

The ASSOCIATED COMPANY is relieved from the NECESSITY OF HAVING ANY CAPITAL INVESTED IN transmitters, receivers or their associated induction coils.

COMMERCIAL

COMMERCIAL ADMINISTRATIVE PROBLEMS

COMMERCIAL ENGINEERING

TRAFFIC PROBLEMS:

of methods for making plans for toll assistance to Associates in making such

of toll rate quot- computing methods to enable toll operdetermine correct toll calls with and effort.

TRAFFIC RESULTS:

Development of means for measuring the quality and efficiency of traffic performance and of methods of traffic management and administration for securing best performance.

Equipment, methods and forms for observing both local and toll service.

Methods and forms for counting and recording the volume of traffic handled; for equating all classes of calls to a common work unit basis and for summarizing in useful form the data thus secured.

Continuous study of switchboard operation, both local and toll, as it is being carried on in the field, to determine and develop best operating technique for making effective the standardized operating practices.

Continuous study of all problems of central office management, such as are involved

COMMERCIAL METHODS AND RESULTS

Study and analysis of all phases of commercial administration and management with a view to assisting the Associated Companies in the establishment of the most effective organization and methods for rendering to the Public the most satisfactory and economical service.

Study and development of best forms of organization and equipment of business offices and most efficient routines for administration of business office work.

Studies and tests of business office supplies and appliances of every description, and standardization of types that best meet requirements of Associated Companies.

SALES METHODS

Study and analysis of the telephone service from the public viewpoint with the purpose of determining the most effective ways and means by which the Associated Companies may serve the interests of telephone users in all lines of business.

Studies of the various uses and applications of telephone service in order to determine and develop the most efficient methods and practices for its systematic and economic employment.

Associated Companies are furnished with information as to the best methods of analyzing service requirements of individual subscribers for the purpose of ascertaining what measures may be taken to increase the utility and efficiency of subscriber's telephone service.

DIRECTORY METHODS.

Study and analysis of directory problems with a view to assisting the Associated Companies in producing directories which shall be of the greatest possible use to the Public, taking advantage of all possible economies in production and distribution.

Studies are carried on relating to the scope and areas to be covered by directories, and to their frequency of issue.

Studies are made of methods of compilation, type styles, methods of listing, book specifications and delivery methods.

FORECASTING THE FUTURE

Associated Companies are furnished with the latest information as to the best methods of making Commercial Surveys to develop the telephone market and to determine the probable extent and direction of the growth of telephone service in order that plans may be made for adequate and economical extension of the plant.

Associated Companies are assisted in the making of specific commercial surveys.

RATE STUDIES

Telephone rates are constantly studied with a view to assisting the Associated Companies in the development of the widest practicable use of the telephone service by the Public, with the production of the necessary revenues.

Information from all sources as to rates and rate practices is collected and analyzed, and advice and information are furnished to the Associated Companies on these matters.

Development for the benefit of the Associated Companies of the fundamental facts and principles of rate making and of methods for applying this information.

[fol. 15545] TOLL CASE—RHODES EXHIBIT 83

What it Would Cost Ohio Bell Telephone Company in State of Ohio to Provide Its Own Instruments

(1)	First Cost: Set of Instruments	~~$4.50~~	
(2)	Annual cost per set of instruments:		
(3)	8% Return on Investment		$.360
(4)	7% Credit to the Account "Reserve for Accrued Depreciation"		.315
(5)	Repairs		.090
(6)	1% Cost of Administration		.045
(7)	2% Reserve for Contingencies		.090
(8)	Sub-Total		$.900
(9)	Average Number of Sets per Station		1.05
(10)	Annual Cost per Station (except Stock of Instruments to Ensure Continuity of Supply) $.900 × 1.05		$.945
(11)	Stock of Instruments to Ensure Continuity of Supply:		
(12)	Proportion of Instruments in Stock	6%	
(13)	6% of $4.50 = $.270		
(14)	Annual Cost of Carrying this Stock:		
(15)	Return on Investment	8%	
(16)	Cost of Administration	1%	
(17)	Insurance and Contingencies	2%	
(18)		11%	
(19)	11% of $.270		.030
(20)	Total Annual Cost per Station		$.975

[fol. 15546] TOLL CASE—RHODES EXHIBIT 84

Titles of Some of the Circular Letters and Specifications That Have Been Prepared for the Associated Companies

Circular Letters:

The "Center Checking" System.
Location of Connector Block used with Hollow Arm.
Private Branch Exchange No. 1—Changes in Operator's Circuit.

Circular Letters—Continued

Alarm Fuses.
Toll Line Construction—Placing Circuits to Admit of Phantoming.
Small Tool Box.
Glass Insulators.
No. 25 Repeating Coil.
Wiring of Desk Stands.
Cable Plans for Small Cities.
No. 14 Cable Terminal.
Galvanized Steel Strand.
Private Branch Exchange No. 2.
No. 10 Switchboard.
Preservative Treatment of Poles.
Iron Wire.
Wiring of Telephone Switchboard Lighting Circuits.
Cable Records.
Height of Wall Sets.
Slotted Lamp Socket Mountings.
Reversing Plugs.
Dry Batteries.
Modifications in No. 17-A Test Set.
[fol. 15547] New Terminal Marking for Toroidal Repeating Coils.
Rural Line Subscribers' Set.
Arrangement of Keyboard Lamp Caps, Guards and Cords.
No. 17 Cable Terminals.
Color Scheme for Desk Stand Cords.
Joints in Iron Wire.
Test for Desk Stand Cord Connections.
Mine Telephones.
Comparative Economies in the Use of Gas and Electricity for Charging Batteries in Telephone Exchanges.
Central Office Building Plans.
Method of Adding Plates to Storage Batteries.
High Resistance Transmitters on Local Battery Lines.
Abandonment of No. 14-A (10 Pair) Cable Terminal.
Use of Lock Nuts in No. 14 Cable Terminals.
Switchboard Lighting.
Fahnestock Test Connector.
Measuring Instrument—Evershed Megger.

Circular Letters—Continued

Modifications in Standard Magneto Subscribers' Sets.

No. 20 Instrument Wire.

Signal Plugs.

Transmission Efficiency of Copper-Steel Outside Distributing Wire.

Tool for Cleaning Switchboard Jacks—No. 8 Switchboards.

Emergency Call Circuits and Emergency Local Ringdown Trunks.

New Toll Switchboard Cord Circuits.

[fol. 15548] No. 11 and No. 12 Protector Micas.

Composite Set Rack.

No. 49 Type Alarm Fuses.

Vogel Ground Clamps.

New Types of Call Wire Trunk Circuits.

Improved Two-Conductor Switchboard Cord.

Toll Switchboard Lighting.

Tool for Grooving Multiple Jacks.

Auxiliary Night Alarm Circuit for Small Offices.

Small Magneto Switchboards.

Standard Traffic Engineering Methods for Use in Connection with Building Plans.

Information on Loading.

Extra Glass Jars for Storage Battery Equipments.

Switchboard Platforms and Operators' Chairs.

Portable Composite Sets.

Phantoming of Rural Subscribers' Lines.

Color Scheme for Ringing Key Buttons and Plug Shells with Mechanically Locking Key Trunks.

Reversite Circuit Breakers for No. 1 Power Plants.

A: Most Economical Sizes of Cable to Install Underground.

B: Provision of Stubs for Branch from Large Cables.

Redesign of No. 103 Plug.

Jack Spring Adjusting Tools.

Standard Lengths for Operators' Telephone Cords.

Modified Nos. 35, 36, 37 and 51 Terminal Strips.

Color of Cords and Shells for Test and Plugging Up Lines.

[fol. 15549] Proposed New Type of Prepayment Multi-Coin Box.

Circular Letters—Continued

Blackburn Ground Clamp with Copper Shoe Attached to Band.

Automatic Switch for Electrolysis Drainage Wires.

Antimony Alloy Sheath for Underground Cables.

All Metal Flush Type Hotel Sets.

Strain Insulators.

Use of Repeating Coils in Toll Cord Circuits for Reducing Noise on Through Toll Connections.

Answering Jack Number Plates with Engraved Special Designations.

Porcelain Knobs.

Underground Conduit—Duct Requirements on Fundamental Plans.

Metal Subscribers' Sets.

Gauge for Testing Individual Dry Cells in Talking and Ringing Batteries.

Transmission Equivalents.

No. 250 Transmitter with Steel Arm.

Standard Switchboard and Circuit Drawings.

Substation Switching Keys.

Loading of Telephone Circuits.

Pole Relays, Code No. 191-A.

Materials for Aerial Loading Coil Construction.

Subscriber's Station Installation—Line and Ground Wire Holes.

Maintenance of Transmitter Batteries at Isolated Telephone Stations.

Jack for Portable Telephones.

Number Plates for Stile Casings—Nos. 107-B and 23-C.

[fol. 15550] Rural Lines—Central Office Equipment and Method of Operating.

"A" and "B" Supervisors' Equipment.

Standardization of 2-½ foot Length for Receiver Cords Used with Desk Stands.

Relay Switchboard No. 10—Provision of Extra Panel of Multiple at the End of the Board.

Method of Increasing "B" Operating Efficiency During Hours of Light Traffic.

Redesigned No. 7 Coin Collector.

Material Used in Exchange Aerial Construction.

Prevention of Electrolytic Corrosion in Prepayment No. 7 Coin Collector Coils.

Circular Letters—Continued

Testing Cabinet for Magneto and Small Common Battery Offices.

Rubber Faced Answering Jack Number Plates.

Wiring of Large Buildings for Telephone Service.

Circuit for Grouping "A" and "B" Positions.

Rules for Resuscitation from Electric Shock.

No. 128 Receivers With and Without Head Bands.

Method of Making Fundamental Plans.

Modified Nos. 38, 39 and 40 Terminal Strips.

Metal Battery Box for Subscribers' Stations.

Method of Wiring Condensers in Toll Cord Circuits.

New Type Transmitter Arms.

Improvement in Blue Bell Dry Battery.

Changes in No. 317 Type Subscribers' Sets.

No. 4 Private Branch Exchange.

Transmitters for Metal Subscribers' Sets.

Changes in No. 17 Cable Terminals.

[fol. 15551] Improved Cord Hole Eyelet for Desk Stand Bases.

Circuit for Grouping "A" and Toll Switching Positions.

Improved Terminal Rack for Desk Stands and Transmitter Arms.

Connecting Block with Soldering Lugs.

Changes in Equipment and Arrangement of No. 1 Trunk Switchboard Keyshelves.

Changes in Nos. 5 and 23 Induction Coils.

Improved Ringer for Common Battery Four-Party Selective Ringing Service.

Phantoming of Rural Subscriber's Lines—No. 1 Retardation Coil Box.

Antimony Alloy Sheath for Aerial Cables.

New Design of the No. 65 Terminal Strip for Horizontal Side of Main Distributing Frames.

Method of Handling Toll Calls from New Type Prepayment Multi-Coin Boxes.

Metal Block Protected Cable Terminal.

Standardization of Black Finish for Ringer Gongs and Clapper Guards.

Wiring of the Outgoing Trunk Multiple Directly to the Main Frame and Intermediate Type Terminal Strip for the Main Distributing Frame.

Circular Letters—Continued

Auxiliary Framing on Terminal Room Ceilings for the Support of Frames, Cable Racks, etc.

Ventilating System for Telephone Booths.

Reporting Defective Material.

Requirements for 25-foot Class "C" Cedar Poles.

New Standard Central Office Message Register—Lockup Type.

Tool for Removing Worn No. 49 Jack Sleeves.

Brush Treatment for Poles.

[fol. 15552] Direct Current Commutating Pole Motors for Charging Generators.

Insulation of Metal Subscriber's Equipment from Metal Walls.

New Phantom Circuit Repeating Coil—Code No. 46-A, Discontinuance of Manufacture of Nos. 25-AA, 37-A, 37-B and 38-B Repeating Coils.

Rubber Covered Plug Shelves.

Improved Worsted Receiver Cords.

New Unit Type Protector Mounting for Main Distributing Frames.

Battery Boxes for Dry Cells—Use of Dry Cells for Morse Local Battery and Transmitter Local Battery.

Rope Containing Metallic Strands.

Supplying Ringing Current over Cable Pairs to Private Branch Exchanges.

One Point Transposition Brackets and Steel Pins for Transposition Brackets.

Standard Drop Light Handle and Guard for Use in Operating and Terminal Rooms.

Folding Door Booth.

No. 50 Type Prepayment Multi-Coin Collector.

Cable Terminal for Use in Buildings—Standarization of No. 22 Cable Terminal and Nos. 1, 2 and 3 Fanning Strips.

Transmission Data.

Power Plant Wiring—Omission of Individual Cell Voltmeter Leads to Storage Batteries.

Pick-up Alarm Circuit—Machine Ringing.

Improved Types "A" and "B" Composite Ringers.

Repair of Tinsel Switchboard Cords.

High Impedance Relay for Use in New Toll Cord Circuits.

Circular Letters—Continued

Testing Circuit for Use in Connection with New Toll Cord Circuits.

[fol. 15553] All Metal Telephone Booths.

New Type Line and Cut-off Relay.

Separation of Aerial Cable Strand Ground and Protector Ground at Underground Cable Terminals.

Street Railway Telephone Set No. 278.

Omission of Subscribers' Multiple from "A" Switchboards—Multiple Answering Jacks and Lamps.

Maximum Cable Lengths.

Concrete Steel Reinforcement for Poles.

Marking of Defective Pairs in Lead Covered Cable.

Alarm Signal for Main Discharge Fuse.

Automatic Keyshelf Brace.

Moistureproof Switchboard Cable.

Improved Two-Conductor Tinsel Switchboard Cord, Improved Test and Morse Board Cords and Service Observing Cords.

Clearance of Telephone Wires, Cables and Guys at Highway Crossings.

(a) Joint Use of Poles.

(b) High Tension Crossings.

Standard Relay Rack.

Standard Floor Plan Arrangements for Telephone Buildings in Single-Office Districts.

Enameled Distributing Frame Wire.

Copper Block Cutout for No. 8 Type Protector.

Transmittal of "Examples Illustrating the Use of the Bulletin on Transmission Equivalents" and Printed Copy of "Supplement No. 1 to Bulletin on Transmission Equivalents."

Railroad Private Branch Exchange Equipment.

New Type Supervisory Relay.

Oil Insulators and Pedestal Supports for Mounting Storage Batteries.

[fol. 15554] Starters for Alternating Current Motors.

No. 5-L Type Message Register.

Standard Armature Air Gaps for Substation Ringers.

Local and Toll Service Observing Equipments.

Standard Message Register Racks and Casings.

Cincinnati Clips.

Circular Letters—Continued

Abandonment of High Resistance Heat Coils.
Standardization of Spring Terminals and No. 540 Cord for Connection of Blue Bell Dry Batteries.
Improved Loud Ringing Extension Bell Sets.
Receiver Cords—Covering for Tips.
No. 29-A Binding Post—Auxiliary Binding Post for Nos. 14 and 8 Cable Terminals.
Routine and Equipment for Handling Trouble Reports and Certain Associated Work.
Recovery of Substation Equipment.
Effect of Metal Prices on Cable Changes.
Waterproof Desk Stand Cords.
Primary Battery for Current Supply for Magneto Switchboards.
Nut Fit for Bolts Having a Short Length of Thread.
Magneto Switchboards No. 105-A and No. 105-B.
Markings Upon Bar and Cake Solder.
Handling Carbon Protector Blocks and Micas.
Telephone Connections for Trains at Stations.
Standard Lengths for Receiver and Desk Stand Cords.
Sleet Storm Data.
Redesigned 3 by 7 Cordless Private Branch Exchange.
Improvements in Design of Central Office Heat Coil.
[fol. 15555] Maintenance of Main Frame Heat Coils and Protector Springs.
Private Branch Exchange Switchboard No. 550-A.
Improved Calculagraph.
Sleeve Joints in Copper Line Wire.
Lubrication of No. 1-A Electric Clocks.
No. 1 Residence System.
Data for Determining the Proper Size of Central Office Storage Batteries.
New Type Metal Subscribers' Set.
Mechanically and Electrically Operated Peg Count Apparatus.
Guy Shield Plugs.
Duplex Cable.
Capacity of Paper Insulated Cable—Proposed Change in Method of Measuring.
Toll Test Board No. 4.

Circular Letters—Continued
Switchboard Clocks for Use at "A" Positions.
Standardization of Outside Plant Practices—Placing Underground Cable and Splicing Lead Covered Paper Insulated Cables.
Change in Manganese Used for Dry Cell Manufacture.
Cable Fault Locating Set—Exploring Coil Type.
Method of Placing Aerial Cable Rings.
Cable Paper.
Use of Superimposed Current for Operation of Selective Four-Party Bells.
Change in Distinguishing Colors on Individual Conductors of Switchboard Cords.
Change in Color Code for Distributing Frame Wire.
Testing Circuit for Toll Line Busy Signals.
New Method of Connecting Four-Party Selective Extension Bells.
[fol. 15556] Exposed Cables Entering Central Office and Subscribers' Buildings.
Transmission Measuring Set.
Resurfacing and Reengraving Call Circuit Key Buttons.
Designation Strips.
Large Gauge Cable.
Type "C" Porcelain Knob.
Switches for Duplex Sets.
Automatic Water-Fillers for Storage Batteries.
Tool for Operating "A" Type Cut-Off Relays Previous to Cutover.
Aerial Cable Rings.
Inductive Interference from Power Circuits.
No. 14 Type Cable Terminals Equipped with Special Wooden Face Panels.
Change in Condensers Used in Subscribers' Sets.
Composite Cable.
New Breast Plate for Operator's Transmitter No. 234.
Monitoring Circuits.
Tool for Adjusting Middle Spring of No. 125 Type Relays.
Cooperation Between Electric Light and Power Industry and Telephone Industry to Reduce Interference.

Circular Letters—Continued

Private Branch Exchange Switchboard—No. 550-B.
Improved Tinsel Cords for Use in Testing Circuits.
Central Information Desk No. 1.
Plugs for Plugging Out Permanent Signals on Magneto Boards and on Common Battery Boards Employing Cut-Off Jacks.
Telegraph Repeater No. 3-A.
Connecting Blocks for Use at Substations.
[fol. 15557] Clamps.
Modified No. 137 Plug for Use in Testing and Service Observing Circuits.
Inspection of Material.
Universal Type Key and Keyshelf.
Cable Grips.
Guy Anchors—Special Types.
New Head Band for Operators' Receivers.
Tinsel Cords.
Use of Tungsten in Place of Carbon Lamps as Resistance Lamps.
Handbook of Substation Practice.
Telephone Repeaters.
Rubber Tube Protectors for No. 87 Operators' Cords.
No. 4-A Foot Switch for Transmitter Cutout.
Telephone Service at Army Mobilization Camps.
Braided Black Enameled Switchboard Wire.
Semi-Hard Black Rubber in Place of Leather as a Covering for Piling Blocks and Keyshelf Lamp Rails.
Colored Lamp Caps.
Exposed Line Transposition System.
Substation Equipment for Army Mobilization Camps.
Use of 1 Microfarad Condenser in Four-party Relay Sets.
Strain Insulators for Long-Span River Crossings.
Portable Capacity Bridge.
Method of Obtaining Ringing Current from Central Office Storage Batteries.
Modification of "A" Operator's Cord Circuit to Facilitate Testing Outgoing Trunk Assignments.
[fol. 15558] No. 35 Battery Gauge.
Mercury Arc Rectifiers for Charging Storage Batteries.

Circular Letters—Continued

Enameled Wire Switchboard Cable.
Location of the Prepayment Coin Box Service Buttons on Mechanically Locking Keys for Toll Switching Trunks.
Meters for Telephone Power Plants.
Improvements in Call Circuits and Trunk Operators' Telephone Sets.
Connecting Blocks for Nos. 4, 5 and 6 Cable Terminals.
Cable Terminals for Use in Buildings—Standardization of No. 23 Type Cable Terminals, No. 4 Type Distributing Rings and No. 4 Fanning Strips.
Location of Supervisors' Equipment on Additions to No. 1 Subscribers' and Trunk Switchboards.
Use of Explosives.
Standard Message Register Racks and Casings—Change in Type of Lock for Sliding Doors.
Manhole Shields.
Gas Engines.
Fire Protection—General Precautions and Protective Apparatus.
Methods for Supporting and Protecting Conductors at High Tension Crossings.
Joint Use of Poles.
Splicers' Contact Points.
Materials for Drop Wiring.
Patent Guy Anchors.
Location of Incoming Call Circuit Grouping Keys.
Binding Posts for Battery and Ground Supply at Floor Type Main Distributing Frames.
Fire Prevention and Protection in Connection with the Construction of Telephone Buildings.
[fol. 15559] Electrolysis.
Color of Cords, Plug Shells, Key Buttons, and Associated Lamp Caps for Central Office and Private Branch Exchange Equipments.
Manhole Ladders.
Locust Insulator Pins.
Telephone Equipment in Connection with the General Consolidation of Railroad Ticket Offices.

Circular Letters—Continued

Moistureproof Desk Stand Cord.
High Tension Joint Use.
Paper on Design of Transpositions.
Standard Power Plants for No. 1-D Central Office Equipments.
Materials for Cable Work.
Resistance Unbalance in Small Gauge Cable Circuits Either Quadded or for Toll Use—Soldering the Joints.
Machine Bolt.
Inductive Interference from Western Union Telegraph Circuits.
Twisted Pair Rubber Covered Wire—Recommended Change in Practice to Meet War Requirements.
Telephone Repeater Balance Requirements.
Moistureproof and Brown Telephone Cords.
Audible Busy Signal for "B" Switchboards.
Registry of Water Stills for Storage Batteries.
Method of Making Short Multiple Cable Taps.
Inside Wiring Cleats.
New Type Relays to Replace the No. 122 and Similar Relays.
No. 2 Type Lamps for Pilot Signals.
Conversion of No. 84-B to No. 84-E Interrupters.
Insulated Screw Eye—Open Type.
[fol. 15560] Audible Ringing Signal.
Toll Test Board No. 4—Improved Open Location Test Circuit.
Strand Reel Jack.
Standard Fuse Boards and Subscribers' and Trunk Coil Racks.
Toll Switchboard No. 2 and Rural Positions at No. 1 Subscribers' Sections.
Dry Battery Cabinets.
Condensers Used in Subscribers' Sets.
Wire for Subscribers' Drops.
Improved Recall Signals.
Inspection and Testing of the Cable Plant.
Substation Sign Installation—Materials.
Waxed Switchboard Cords.
Station Ground Wire Moulding.
New Finish for Desk Stands.

Circular Letters—Continued

Correctness of Loading Testing Set.
Pipe Ripper.
Castings for Underground Construction.
Cable Racks and Hooks.
No. 14 Ground Wire.
Portable Cord Circuit Repeater Set.
Improper Arrangement of Gas Engine Exhaust Piping.
Electrical Starting of Gas Engines.
Lithoprint Process of Making Prints and Tracings.
Local Operating Room Desks.
Narrow Base Keys for Manual Ringing Trunks.
Cable Reel Trailers.
[fol. 15561] Timing Devices at Recording Boards.
Pole Dinkeys.
Telephone Repeaters—Improved 21-Circuit Test for Balance.
Telephone Repeater Equipment—Space Battery Alarm Circuit.
Repair Clerk's Desk No. 1.
Message Register Keys.
Jack Space for Use with No. 118 Lamp Socket Mounting.
Modified No. 25 Tool.
Machine for Boring Pole Holes.
Decimal Timer Split-Second Stop Watch.
Telephone Interference Factors of Power Voltages.
Final Report of the Joint Committee on Inductive Interference and General Order No. 52 of the Railroad Commission of the State of California.
Portable Resonant Wave Analyzer.
Pipe Caps and Pipe Cap Molds.
Rope Mat.
Aerial Cable Guide.
Wire Type Head Bands for Operators' Receivers.
Trolley and Tree Guards.
Change in A1S Blackburn Ground Clamps.
No. 8 Cable Terminals.
Nos. 26 and 27 Protector Blocks.
"Square Phantom" Telephone Circuits.
Standardization of Open Wire and Office Type Building-Out Condensers.

Circular Letters—Continued

New Induction Coil for Subscribers' Sets.

[fol. 15562] Hundred Second Timer—100 Second Dial Split Second Stop Watch, Direct Readings in Seconds.

Tandem Operation of Telephone Repeaters.

New Operator's Receiver.

Furnace Shield.

Handling of Explosives.

Use of Series Multiple Pothead on Jointly Used Poles.

Standardization of "B" Cable Terminal.

Paper on Telephone Repeaters.

U Cable Guards.

Floor Outlet for Protecting Inside Wires and Cables.

Requirements for Repaired Condensers Employing Paper Dielectric.

Line Impedance Measuring Apparatus.

Cable Balconies and Pole Seat.

Outside Plant Symbols.

Wooden Pole Brackets and Pole Steps.

No. 6 F Connecting Block (13 Pair) and No. 6 Fanning Strip (13 Pair).

Eye Bolts and Eye Nuts.

Grade Clamps.

B Booster Hook.

Distributing Frame Wire.

Magneto Subscribers' Sets Employing 2500-Ohm Ringers of the No. 8 Type.

Cable Extension Arms.

New Substation Protector for Use Where Lines Enter Substations in Cable.

Bridle Wire Insulator.

[fol. 15563] Vacuum Tube Repeater Sockets.

Modifications of No. 4-A Buzzer.

Carrying Case for Protector Blocks.

Bulletin on Sags and Tensions of Suspension Strand for Aerial Cable.

Spout Strap.

Non-Multiple Private Branch Exchange Switchboards for Operation with Machine Switching Central Offices.

Circular Letters—Continued

Substation Installation—Improved Inside Wiring Nail.

Braces for F. X. Terminals.

Central Office Names for Use in Machine Switching Exchanges.

Magneto Substations—Abandoning the No. 12-A and No. 12 AP Protectors.

No. 317 Magneto Type Subscribers' Sets—Use of Desk Stand Transmitter.

24 Gauge Cable.

Precision Type Basic Networks.

Pipe Straps.

Standard Operators' Chairs.

Changes in Subscribers' Numbers in the Series 1 to 999 Due to Introduction of Machine Switching Equipment.

Modifications in Cord Equipment at Outward Toll Positions.

Changes in No. 135 Plug.

Machine Switching Substations—Instruction Cards for Dials.

Machine Switching Substations—Installing Subscribers' Sets with Dial.

No. 59 Type Condensers.

Outline of Special Work in Connection with the Cutover of a Machine Switching Office.

[fol. 15564] Cutover of Machine Switching Offices—Temporary Operators' Positions.

Reduction in Thickness of Cable Sheaths.

Transposition Running Board.

Carrier Current Systems.

Transmission Testing Apparatus—Coding System.

Maintenance Information Covering Private Branch Exchange Switchboard No. 550-C.

Mechanical Toll Ticket Distributing System.

New Substation Coin Collector Circuit to Reduce Beating at Two-Party Selective and Four-Party Semi-selective Stations having Desk Stands.

Preservative Treatment for Pole Butts.

Paper on Carrier Current Telephony and Telegraphy.

Circular Letters—Continued

Enameled Distributing Frame Wire—Change in Coil.
No. 146 Tool for Removing Lamp Caps and Number Plates.
No. 60 Type Designation Strips.
No. 5 and No. 6 Type Signal Plugs.
Improved Heat Coil for Morse Battery Leads.
Spring Tweezers—No. 149 Tool.
Holder for Key Sleeves Used at "A" Operators' Positions.
Designation Strips—Modifications in No. 8 Type.
Machine Switching Substations—Instructing Party Line Subscribers How to Make Reverting Calls.
Ticket Holder for Use at Outward Toll Positions.
Method of Estimating Interoffice Trunk Requirements.
C S Ground Clamp.
Improvements in Construction of No. 20-A Test Set.
[fol. 15565] Calibration of Apparatus for Measurement of Telephone Interference Factor of Voltage.
Method of Operation of Step-by-Step Machine Switching Equipment.
New Apparatus Blank for Machine Switching No. 50 Type Coin Collectors.
Long Handled Shovels and Digging Spoons.
Non-Multiple Cordless Private Branch Exchange for Operation with Machine Switching Central Offices—No. 505-C.
No. 50 Prepayment Type Coin Collector—Steel Housing Construction.
Service Observing Equipment for Use with Machine Switching Central Offices.
Transmission Tests on Manual Exchange Area Circuits and Equipment.
Page Printing Telegraph System Employing Type Bar Printer and Associated Apparatus.
Condenser Arrangement for Neutralizing Crossfire Between Open-Wire Telegraph Circuits.
Galvanized Pole Steps.
Numbering of Line Registers.
Six Pair No. 6-G Connecting Block.
No. 493-B Peg Count Register Key.

Circular Letters—Continued

Improved Single and Double Pulley Cord Weights and Cord Pulleys.
Tinned Copper Sleeve for Cable Conductors.
Improved Open Space Cutout for the Main-Distributing Frame Protector which Mounts on 3/8" Centers.
Sleet Storm Map.
3-A Transmission Measuring Set.
Short Lengths of Inside Wire.
[fol. 15566] Improvements in Operator's Set.
Paraffin Pots.
No. 4 and No. 6 Bridging Connectors.
Substation Soldering Copper Heater.
Fuse Wrench.
4-A Transmission Measuring Set.
D P Insulator.
Underground Construction—Forms for Concrete Manholes.
Method of Assigning Lines and Trunks—Panel Machine Switching Equipment.
Six-Pair Metal Building Terminal Box.
Abandonment of Practice of Providing No. 10 B & S Gauge Conductors in Toll Entrance Cables.
Wooden Apparatus Blanks.
One Sheave Cable Block.
Standardization of Long Cords for Use at Substations.
Standardization of Porcelain Type Open Space Cutout and Nos. 83-A and 84-A Protector Mountings.
Improved Window Frame for No. 10-A Message Register.
Relay Contact Burnisher—No. 265 Tool.
Eastern White Cedar Poles.
3-A Oscillator.
No. 50-A Repeating Coil.
Improved Cross-Connecting Ring for B Cable Terminal.
Telephone Attachments at Substations.
New Substation Transmitter for Use on Long Loops.
High Impedance Ringer to Reduce Inductive Noise on Two-Party Selective and Four-Party Semi-Selective Lines.

Circular Letters—Continued

Public Telephone Stations—Open Type Telephone Booth.

[fol. 15567] Form for Record of Explosives.

Phenol Fibre Tops for Horizontal Type Keys with Indicators.

Cabinets for Storage of Operators' Telephone Sets.

Strength of Old Eastern White Cedar Poles.

Earth Boring Machines.

Substation Number Plates.

M. D. F. Test Plug No. 206.

Improvements in No. 8 Terminals.

No. 2-A Repeater Gain Set—Bulletin No. 27.

Manhole Cover Hook.

Cable Splicing Operations in Machine Switching Areas.

5-A Carrying Case.

Auxiliary Receivers for Use at Substations.

Routine for the Inspection of Operators' Telephone Sets.

Machine Switching Substations—New Dial Cord for Desk Stands.

Metal Subscribers' Sets—Change in Construction of Base.

Small Gauge Non-Quadded Cables Manufactured with Staggered Pair Twist.

Machine Switching—Maintenance of Dials at Substations and Central Offices.

Public Telephone Stations: Booth Lamp Guard.

Power Pumps.

Unit Type Magneto Switchboard No. 1800.

Method of Assigning Lines and Trunks—100 Point Step-by-Step Machine Switching Equipment.

5/8 Inch Forged Eye Nuts.

B Guy Shield.

[fol. 15568] "R" and "S" Cable Balconies.

1-A Transmission Measuring Set, 2-A Oscillator, and Detailed Methods for Making Transmission Tests on Manual Circuits and Equipment.

Method of Operation of Panel Machine Switching Equipment.

Machine Switching Operators' Dialing Tools.

Circular Letters—Continued

Trouble Operators' Positions for Switchboards Nos. 1, 1-C and 1-D.
Toll Operating Room Desks.
Public Address Systems.
Lanterns.
Standard Traffic Engineering Practices for Local and Toll Central Office Equipments.
Pole Derrick Jacks.
Pole Derricks.
Truck Bodies.
Nos. 7, 8 and 9 Fanning Strips.
Storage Battery System for Supplying Coin Collect Current.
Substation Materials—Tools and Gauges—Battery Light.
Substations—Desk Stands—New Felt for Base.
Outside Plant Engineering Practices.
Pulling-Up Clamp.
Strand Puller.
Wooden Cable Dresser.
Blasting Mat.
Wiping Cloths and Crotch Cloths.
Splicer's Mirror.
Multiple Private Branch Exchange for Operation with Manual and Machine Switching Central Offices—No. 600-C.
[fol. 15569] Calculagraphs—Automatic Ribbon Reverse and Improved Winding Tool.
Bower Barff Finished Hand Wheels for Power Switchboards.
New "A" and "B" Operators' Telephone Sets.
Ground Wire.
⅜-Inch Woven Conduit.
Cardboard Containers for First Aid Materials.
Solder Pot.
Paraffin Dipper.
Substations-Protection—No. 60-A Fuse.
Power Plant and Main Distributing Frame Grounding System.
Iron Cable Dresser.
Inadequate Separations on Jointly Used Poles and at Crossings of Telephone Wires over Foreign Wires.

Circular Letters—Continued

Simplex Pole Jack.
Public Telephone Stations—Booth Lamp Receptacle.
Quickly Detachable Dial Mounting for Central Office Switchboards, Attended Pay Stations and P. B. X. Switchboards.
Transposition Practices (Exclusive of Construction).
Use of Shellac on Cable Forms.
Distinctive Markings for Staggered Twist Construction in Small Gauge, Non-Quadded Cables and for Experimental Cables.
135-Cycle Signaling Motor-Generator Sets.
Modification of No. 2 Private Branch Exchange System for Machine Switching Operation.
Cable Bending Spring.
Substations—Materials—Tools and Gauges—No. 311 Tool.
[fol. 15570] Tool for Removing Signal Plugs—No. 274 Tool.
Toll Transmission Practices—Section IX-A—Vacuum Tubes Used in the Bell System—Bulletin No. 77.
Telephone Repeater Data—Section II-E—Arrangement for Connecting Cord Circuit Repeaters to Circuits Terminated with Three-Winding Transformers—Bulletin No. 74.
Transmission Maintenance Practice—Section VIII-E—Routine for Toll Circuit Layout Records.
Manhole Platform Support.
Waxed Linen Thread.
Rubber Bandages and Bag for Rubber Bandages.
Splicers' Tents.
Substations—Signs—Sign Cement Kit.
Toll Switchboard No. 1—Flush Type Glass Keyshelf Bulletin Holder.
Round Washers.
Half Round Wooden Moulding.
Substations—Tools and Gauges—Transmitter Carrying Bag.
Type A Porcelain Knob.
Substations—No. 152-A Backboard for Loud Ringing Bells.
Insect Injury to Cable Sheath.

Circular Letters—Continued

Termination of Railroad Dispatch and Message Circuits in P. B. X. Switchboards.
Splicer's Fibre Test Board.
Goggles.
Substations—Coin Collectors—Carrying Case for Coin Relays and Container for Coin Chutes.
Renumbering Strips.
Pot Hook.
[fol. 15571] 1-Inch Cotton Tape.
Shave Hook.
Fanning Strips for Cable Terminals.
Terminal Tag.
Rubber Tape.
"B" Tree Guard.
Chipping Knife.
Fanning Strips for Protected Building Terminals.
Substations—Coin Collectors—No. 50 Type for Post-payment Service.
Phantom Repeating Coils.
Sag Gauge.
Linemen's Hand and Test Sets—Standard Cords and Change in Finish.
Standardization of Lengths of Stub on No. 14 Cable Terminals.
Storage Battery System for Supplying Message Register Current in Manual Offices.
Terminal Marking Outfit.
Terminal Clamp.
Eye-Bolt Method for Dead-Ending Strand and Attaching Guys.
Devices for Securing Cable Clamps to Masonry.
First Aid Supplies.
Apparatus Blanks for Covering Banks of Unused Subscribers' Multiple Jacks.
Transmission Maintenance Practices—Section VI-B—Methods for Making Transmission Tests on Step-by-Step Machine Switching Circuits and Equipment.
Square Washers.
Bulletin Holder for Use on Switchboard Sections.

Circular Letters—Continued

[fol. 15572] Carrier Current Systems Data—Sections V-C and D—"Carrier Telegraph System Terminal—Type 'B' "—Bulletin No. 94.
Stove Bolts.
Maintenance Tools for No. 14 Cable Terminals.
Substations—Test Sets—No. 17 Linemen's Type.
Crosstalk Practices Sections V-A—50-A Crosstalk Set—Bulletin No. 80.
No. 29-B Binding Post.
Telephone Repeater Data—Section II-B—Singing Point Data.
Clearing Substation Grounds on No. 26 and No. 27 Protector Blocks by Means of 200-Volt Breakdown Test.
Line Thermometer.
Guy Rule.
Substations—Tools and Gauges—Shellac Set for Installers and Repairmen.
Toll Signaling Equipment—Adjustable Back-Stop for No. 150 Type Relays.
Trouble Back Flash.
Local Peg Counts.
Toll Peg Counts.
Traffic Summaries.
Changes on Peg Count Summary and Statement of Traffic Costs.
Notes on Work Involved in Installation of Standard Toll Rate Quoting Systems.
Central Office Operating Routine, Telegrams Telephoned.
Fire Drills for Operating Force.
Standard Local Operating Practice—Multiple Markings and Number Change Bulletins.
[fol. 15573] Standardization of Toll Tickets.
Standard Local Operating Methods—Disposition of Calls Resulting in Busy Reports.
Standard Toll Operating Methods: ST, TT and CC Methods.
Toll Line Efficiency.
Division of Toll Board Traffic.
Toll Recording Systems.
Improved Two-Number Toll Operating Method.

Circular Letters—Continued

Standard Local Operating Methods—Handling Calls to Private Branch Exchanges When the Attendant is not on Duty.
Standard Two-Number Toll Service Observing Method.
Losses from Operating Force.
Standard Local Operating Practice.
Peg Count Accuracy.
Training of Toll Service Observers—Special Correspondence Course Plan.
Information Regarding the New Telephone Number or Location of Subscribers Who Move from One Exchange District to Another.
Peg Count Form E-101-B; Hourly Peg Count Record.
Improved Toll Operating Practices.
Connection Between United States Coast Guard Lines and the Bell System.
Single Ticket Method—Collect Calls.
Standard Local Operating Practice—Forwarding Sections Applying to Switchboards of the No. 1-C Type.
Use of Toll Service Observing Data for Effecting Improvement in Toll Service and Operating.
Condensed Peg Count Summary.
[fol. 15574] Changes in Operating Practices Required by the Daylight Saving Law.
Revised Traffic Circular No. 27—Toll Peg Counts and Revised Toll Coefficients.
Standard Local Operating Text Book.
Instructions for Determining the Rates and Charges for the Different Classes of Toll Service Established by Order No. 2495 of the Postmaster-General.
Adjustment of Force.
Local Operating Text Book for Training as to Ticketed and Registered Message Rate Operating.
Collection of Federal Tax on Telephone Messages.
List of Stations in Toll Tariff Books.
Junior Operators' Text Book.
Record of Completed Toll Calls to Replace Lost Call Record.
Toll Line Efficiency—Basic Data for Toll Line Engineering Purposes.

Circular Letters—Continued

Operating Instructions in Connection with the Standard Classification of Toll Service and Schedule of Toll Rates.

Toll Service Observing.

Notes on Local Training Department Equipment and Arrangement of Building Space.

Use of Routine Toll Service Observations for Maintaining a Record of Speed of Service on Important Toll Traffic Routes.

Notes on Method for Use in Training Departments for Local Operators.

Dispatch Method for Handling Toll Calls.

Use of Plug Count Records for Balancing "A" Board Loads.

Daily Force Conditions.

Local Service Notes.

Central Office Instructions.

[fol. 15575] Discontinuing the Practice of Holding at Recording Boards.

Toll Service Observing—Call Circuit Method Traffic.

Toll Line Engineering—Tables of Circuit Group Capacities.

Monthly Force Condition Summary—Form E-140.

Instructions for Attendants at Private Branch Exchanges.

Standard Toll Operating Practice—Supplementary Instructions Covering the Handling of Calls with Stations Connected to a Local Mechanical Office.

Method of Repeating Five Digit Numbers and Numbers to which Zeros have been Prefixed.

Toll Line Engineering—Method for Collecting and Summarizing Basic Traffic Data.

Local Manual Service Observing.

Standard Toll Operating Practice.

Outward Operators' Text Book, Recorders' Text Book, Inward Operators' Text Book.

Count of Employee Hours.

Equating Traffic.

Ventilation and Heating of Central Offices and Operators' Quarters.

Objective and Basic Loads.

Circular Letters—Continued

Instructions for Attendants at No. 505-C Private Branch Exchanges.
Single Ticket Operating Method—Overlap Ringing.
Quiet Operating Rooms.
Suggestions as to Protection of Operating and Clerical Forces Against Colds and Similar Infections.
Development and Handling of Toll Sequence Service.

[fol. 15576] Specifications:

Steel Framework for Central Office Equipment.
Local Chief Operator's Desk No. 3.
Toll Chief Operator's Desk No. 2.
Woodwork and Leather for Central Office Equipment.
Slate Used in Central Office Equipment.
Gas Engine for Use in Telephone Exchanges.
Eleven Pair Lead-Covered Submarine Emergency Cable.
Twelve Pair Emergency Line Cable.
Standard Reel Rack.
Seven Pair Emergency Line Cable.
Toll Test Board No. 2.
Toll Test Board No. 1.
Lead-Covered Cable with Wool Insulation for Inside Construction.
Manager's Desk No. 7.
Information Desk No. 5.
Dead Man.
Nails (Galvanized and Tinned).
Fifteen Conductor Emergency Cable Reel.
Portable Service Testing Set No. 1.
One Pair Emergency Cable Reel.
One Pair Emergency Cable.
Description of Central Office Equipment with Relay Switchboard No. 9.
Manhole Guard.
Installing a Gas Engine for Use in Telephone Exchanges.
Stringing Hard-Drawn Copper Wire.
[fol. 15577] Wire Chief's Desk No. 7.
Red Cedar Poles.

Specifications—Continued

Chief Operator's Desk No. 6.
Manager's Desk No. 8.
Chief Operator's Desk No. 7.
Chief Operator's Desk No. 8.
Light Galvanized Steel Seven Wire Strand (Mild Steel).
Wiring of a Central Office Equipment.
Central Office Equipment with Relay Switchboard No. 9 for Small Office with Single Position.
Fire and Sand Pails.
Hole Cleaner.
Installation of Office Terminals of Wool Insulated Cable.
Inspection of a Dirt Auger.
Crossarm Cleats.
Asbestos Blanket with Containing Case.
Galvanized Steel Suspension Wire.
Cleats and Binding Posts for Cable Boxes.
Inspection of No. 4 Protectors and Associated Apparatus.
Inspection of a Box for Holding Protector Parts and Tools in Cable Boxes.
Ten Pair Bridle Wire Cable.
Five Pair Bridle Wire Cable.
Wire Chief's Desk No. 8.
Description of the Method of Operation for Wire Chief's Desk No. 8.
Wire Chief's Desk No. 9.
[fol. 15578] Description of the Method of Operation for Wire Chief's Desk No. 9.
Lockers.
Standard Combination Reel.
Instructions for Connecting Special Steel and Copper Wire at Long Spans.
Six Pair Bridle Wire Cable.
Chief Operator's Desk No. 9.
An Extension Fixture.
Structural Steel.
Lead-Covered Paper Insulated Bridle Cable.
Wall Tent Stoves.
Creosoted Gum Plank.

Specifications—Continued

Description of a Central Office Equipment with Relay Switchboard No. 10.
Chief Operator's Desk No. 10.
Wire Chief's Desk No. 10.
Method of Operating Wire Chief's Desks No. 10 and No. 11.
Instructions for the Maintenance Inspection of Crossarms and Guying.
Five (5) Wire Crossarm Cleat No. 2.
Construction of 40 to 80 Wire Pole Lines.
6,000 Pound Strand.
10,000 Pound Strand.
16,000 Pound Strand.
Toll Supervisor's Set No. 4.
Toll Supervisor's Set No. 5.
Creosoted Blocks for Three Block Anchors.
Wire for Lightning Arresters T-533-B.
[fol. 15579] Wire Chief's Desk—Wall Type No. 11.
Instructions for Use of Creosoted Three Block Anchors.
Method for the Analysis of Solder.
Aerial Cable Hangers.
Protection of Telephone Lines Crossing High Potential Lines—Short Span Method of Protection.
Toll Ticket Filing Desk No. 1.
Substation Ground Wire.
Transposition Glass Insulators.
Inspection of a Long Handle Shovel.
Inspection of a Digging Spoon.
7,000 Pound Two Wire Galvanized Steel Strand.
Treated and Untreated Square and Round Conduit Plugs.
Installation of Iron Case Loading Coils on Open Wire Lines.
Steel Prod.
Malleable Castings.
Treated Wrought Pipe and Lap Welded Casing.
Staples.
Carriage Bolts.
Instructions for Making Phantom Circuit Transpositions.

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Specifications—Continued

Galvanizing for Iron and Steel.
Wire Chief's Desk No. 2.
Method of Operation for Wire Chief's Desk No. 2.
Phantom Circuit Transpositions.
Malleable Iron Clamp.
Cribbing Guards.
[fol. 15580] Creosoted Plank for Two Block Anchors.
Paper Sleeves for Splicing Paper Insulated Cables.
Making Phantom Circuit Transpositions with Pole Circuits on Adjacent Arms as Side Circuits.
Phantom Circuit Transpositions with Pole Circuits as Side Circuits.
Crossarm Paint.
Long Open Wire Spans at River Crossings.
Galvanized Best-Best Iron Wire.
Galvanized Steel Wire.
Installation and Operation of Pole Relays No. 191-A.
Galvanized Steel Wire for River Crossings.
Installation of Local Telegraph Sounders.
Lightning Arrester T-533-B.
Installation of Bridle Wire Electrose Insulators.
Standard Black Pole Paint.
Standard White Pole Paint.
Galvanized Pole Brackets.
Crossover Clamps.
Steel Angle Support for Long Span Wire Hanger on Pole Fixture.
Bridle Cable Hanger.
Stub Reinforcement for Poles.
Single and Twisted Pair Braided Rubber Covered Wire for Morse Circuits.
Transposition Bracket for Double Petticoated Porcelain Insulators.
Creosoted Yellow Pine Crossarms.
Exchange Aerial Construction.
[fol. 15581] Installation and Operation of Composite Ringing Set for Telephone Lines.
Eastern White Cedar Poles.
Installation of Iron Case Loading Coils on Phantom Open Wire Lines for Phantom Circuits 1-2-3-4, 3-4-5-6, 5-6-7-8 and 7-8-9-10.

Specifications—Continued

Installation of Iron Case Loading Coils T-685 on Open Wire Lines for Circuits 1-2 and 3-4 and Corresponding Circuits on Other Arms. Arranged so that Phantom Coils T-680 may be Installed on These Circuits at Some Future Time.

Installation of Phantom Loading Coils T-680 on Open Wire Lines for Phantom Circuits 5-6-7-8 and Corresponding Circuits on Other Arms. Arranged so that Loading Coils T-685 may be Installed on These Circuits at Some Future Time.

Inspection of Worn No. 49 Jacks.

Inspection of Worn Plugs No. 109 and No. 110.

Installation of Phantom Loading Coils T-680 on Open Wire Lines for Phantom Circuits 1-2-3-4, 3-4-5-6 and 7-8-9-10 and Corresponding Circuits on Other Arms. Arranged so that Loading Coils T-685 may be Installed at Some Future Time.

Galvanized Aerial Cable Rings.

Galvanized Pothead Support.

Pole Tongs.

Galvanized House Bracket for Dead-Ending Copper-Steel Drop Wires.

Cable Suspension Clamps.

Instruction for Placing Loading Coil Cases and Connecting Loading Coils to Underground Cable Conductors Used in Parallel.

Vitrified Clay Conduit.

Installation of a No. 44-C Retardation Coil on Open Wire Circuits to Obtain a Rural Line Phantom.

Western White Cedar Poles and Guy Stubs.

[fol. 15582] Galvanized Sheet Iron Cable Shields.

Sawed Redwood Poles.

Dipping Douglas Fir Crossarms in Hot Carbolineum.

Painting Crossarms.

Porcelain Knobs.

Insulating Sealing Compound.

Carbolineum and Similar Wood Preserving Oils.

Analysis of Carbolineum and Similar Wood Preserving Oils.

Toll Test Board No. 4. Description of Apparatus and Methods of Testing.

Specifications—Continued

40-60 Solder.
45-55 Solder.
50-50 Solder.
Pothead Wire.
Installation and Maintenance of an Automatic Switch in Electrolysis Drainage Wires.
Toll Test Board No. 4.
Wheatstone Bridge No. 111077 Toll Test Board No. 4.
Cement.
Inspection of Cement.
Rack for Composite Sets and Composite Ringer Sets.
Replacement and Reinforcement Inspection of Pole Lines.
Installation of Loading Coils T-300, T-680 and T-685 on Open Wire Lines.
Crossarm Braces.
Hub Guards.
No. 17 Gauge Tinned Copper Steel Wire.
Composite Sets for Telephone Lines.
[fol. 15583] Artificial Cables for Use in Transmission Testing.
Underground Conduit Construction.
Installation and Operation of Simplex Sets.
The Brush Treatment of Poles.
Standard Intermediate Distributing Frames.
Transposing Single and Phantom Circuits and Dead Ending Wires at Test and Terminal Poles, Each Wire Attached to a Separate Insulator.
Provisional Specifications for Gray Iron Castings.
Provisional Specifications for Conduit Castings.
Provisional Specifications for Pulling-In Iron.
No. 22 Gauge Lead Covered Silk and Cotton Insulated Cable Without Color Code.
No. 22 Gauge Lead Covered Silk and Cotton Insulated Cable with Color Code.
Filled No. 22 Gauge Lead Covered Silk and Cotton Insulated Cable with Color Code.
Master Specifications for Armored Submarine Duplex Cable.
Composite No. 19 and No. 22 B. & S. Gauge Duplex Cable.

Specifications—Continued

Instructions for Installing Duplex Cable Using Capacity Unbalance Testing Sets.
Master Specifications for Duplex Cable.
Duplex No. 19 and No. 16 B. & S. Gauge Lead Covered Silk and Cotton Insulated Cable.
Standard Relay Racks.
Analysis of Dead Oil of Coal Tar or Coal Tar Creosote.
The Care and Operation of Storage Batteries.
Standard Message Register Racks and Casings.
Local Test Desk No. 12.
[fol. 15584] Local Test Desk No. 12—Description and Method of Operation.
Liquid Grade Dead Oil of Coal Tar.
Creosoted Rock Elm Insulator Pins.
No. 14 Ground Wire.
Inside Wire.
Standard Main Distributing Frames.
Douglas Fir Crossarms.
Aerial Cable Safety Straps.
Substation Apparatus.
Substation Apparatus Installation.
Substation Wiring.
Substation Connections.
Adjustment of Substation Apparatus.
Substation Sign Installation.
No. 50 Coin Collector Installation.
No. 50 Coin Collector Maintenance.
Substation Wiring Plans.
Main Frame Protection—"B" Type Frames.
Main Frame Protection—"A" Type Frames.
Preliminary Specifications for Locating Telephone Circuit Transpositions. Exposed Line Transposition System.
General Specifications for Equipments for United States Military Mobilization Camps—One Infantry Division.
General Cable Splicing.
Underground Cable Splicing.
Aerial Cable Splicing.
Black Cable Splicing.
House Cable Splicing.

Specifications—Continued

[fol. 15585] Substation Protection Including Private Branch Exchanges.
Strand Connectors.
Pole Line Construction.
Guying.
Open Wire Construction.
Aerial Cable Construction.
Drop Wiring.
Block Cable Construction.
House Cable Placing.
Douglas Fir Guard Arms.
Creosoted Yellow Pine Guard Arms.
Reinforcing Links.
Guy Rods Integral to Patent Guy Anchors.
Galvanized Wood Screws.
Hand Magazine for Dynamite.
Hand Magazine for Electric Blasting Caps.
Wooden Pole Steps.
Tree Blocks.
Creosoted Pine Stubs.
2,200 Pound Strand.
Provisional Specifications for Paraffin.
Instructions for Using Correctness of Loading Testing Set in Installing Loading Coils.
Standard Fuse Boards.
Tin Coating on Copper Wire.
No. 19 A. W. Gauge Armored Submarine Cable.
Care of Trailer Axle Bearings.
[fol. 15586] Operation of Cable Reel Trailer.
First Aid.
Underground Cable Placing.
Tree Pruning.
Thimbles.
Cable Terminating.
Jointly Used Wood Pole Lines Carrying Supply Circuits and Signal Circuits.
Porcelain Strain Insulators.
Drive Screws.
Reinforcing Strap.
Distributing Frame Wire.
455 Pair No. 19 Gauge Cable.
Body Belt and Safety Strap.

Specifications—Continued

Dowel Pins.
Cable Terminal Wire.
Rock Guy Anchors.
Creosoted Wood Conduit.
Creosoted Plank.
Sleeve Twisters.
Steel Cable Crossarms.
CL Tree Wire.
Weatherproof Copper Wire.
Bridle Rings.
Exchange Insulators.
Toll Insulators.
Double Petticoated Insulators.
[fol. 15587] Second Grade Vitrified Clay Conduit.
The Submersion Treatment of Poles.
No. 24 Gauge Cables, Aerial, Type "NM".
No. 22 Gauge Cables, Type "ANA".
No. 19 Gauge Cables, Type "ANB".
Ground Rods.
Muslin.
No. 22 Gauge Cables (For Underground Use), Type "ASA".
Use of Dynamite.
Weatherproof Steel and Best-Best Wire.
Strain Plates.
Thimble Guy Rods.
Copper Wire.
Copper Tie Wires.
Tinned Steel Sleeves.
Copper Sleeves.
Stubbing Bolts.
Routine for Report of Cable Troubles.
Code for Reporting Cable Troubles.
045 Tinned Alloy Wire.
Bronze Drop Wire.
Wooden Pole Brackets.
Galvanized Pole Steps.
Construction Chains.
Washers.
One Bolt Clamp.
[fol. 15588] Rosin Core Solder.
S Tree Wire.

Specifications—Continued

Tamping Bar.
Cable Protection.
Maintenance of Automatic Electric Company's Dials at Substations.
Machine Switching Substations.
Chestnut Poles.
Black Stencil Paint.
Orange Stencil Paint.
Substation and Private Branch Exchange Protector Installation.
Underground Conduit for Service Connections.
Crossarm Bolts.
Green Pole Paint.
Operation of Power Diaphragm Pump.
Guy Clamp.
Braces for Extension Fixture and Terminal Pole Crossarms.
Friction Tape.
Houseline.
Railroad Crossings.
Cable Clamps and Cable Clamp Rings.
Operation of Pole Derricks.
Bolts for Cable Suspension Clamps.
Bonita Cable Rings.
Digging Bar.
Cant Hooks.
Creosoted Yellow Pine Poles.
[fol. 15589] Cast Iron Bends.
Stop Accidents Insigne and Year Plates.
Wooden Insulator Pins.
Cable Car.
Manila Rope.
Coal Tar Creosote.
Creosote—Coal Tar Solution No. 1.
Creosote—Coal Tar Solution No. 2.
Creosoting Timber.
Creosoting Yellow Pine Crossarms.
Pike Poles.
Terminal Marking.
Rubber Gloves.
Creosoting Douglas Fir Timber.
Creosoted Douglas Fir Conduit.

Specifications—Continued

Corner Bridle Rings.
Maintenance of No. 14 Cable Terminals.
Steel Tie Wires.
D Cardboard Container.
Tourniquet.
Reducing Couplings.
B First Aid Box.
C First Aid Box.
D First Aid Box.
Creosoted Multiple Wood Conduit.
British Creosote.
[fol. 15590] 1½ Inch Compresses.
3 Inch Compresses.
Iodine Swabs.
Wire Splint.
Provisional Specifications for Lead Sleeving.
Western Cedar Poles.
Manhole Frames and Covers.
Butt Treating Cedar Poles.
Enameled Telephone Signs.

[fol. 15591] Toll Case—Rhodes Exhibit 87

Some Cases of Work Completed

(Plant Matters Only. Traffic and Commercial Problems Not Included)

Equipment Matters:

Improved Switchboard Section—No. 92 Jack "A" Section.
Improved Switchboard Section—No. 49 Jack "A" Section.
Improved Switchboard Section—No. 92 Jack "B" Section.
Improved Main Distributing Frame.
Improved Intermediate Distributing Frame.
Improved Relay Rack.
Improved Coil Rack.
Improved Fuse Panels.
Improved Message Register Racks and Casings.
Improved Miscellaneous Equipment Practices.

Equipment Matters—Continued

Improved Miscellaneous Installation Practices.
Auxiliary Framing for Frames and Racks.
Location of Rolling Ladders.
Standardization of Switchboard Wiring and Mounting of Apparatus for Central Office Equipment and Private Branch Exchange Equipment.
Improved Keyless and Machine Ringing Trunks.
Improved Toll Cord Circuits to Overcome Transmission Losses.
Improved Circuits for Call Wire Toll Lines.
Improved Toll Switchboard Section.
Improved Switchboard Cord Weight.
Improved Switchboard Plug Shelf.
Improved Switchboard Cord.
Improved Method of Switchboard Lighting.
[fol. 15592] Improved Mounting for Central Office Protectors.
Improved Private Branch Exchange No. 4.
Improved Switchboard Plug.
Combined Ringdown and Recording Trunks.
Design of Fire Screens for Switchboard Sections.
Determination of Limits of Wear for Switchboard Plugs and Jacks.
Standardization of Gas Engines.
Design of More Economical Condenser.
Design of Multiple Private Branch Exchange.
Study of Comparative Economies from the Use of Gas Engines as Compared with Electric Motors, Defining the Proper Field for Each.
Improvement in Storage Batteries.
Standardization of Method of Adding Plates to Storage Batteries.
Standardization of Central Office Power Machines and Accessories.
Investigation of Mercury Arc Rectifiers for Charging Storage Batteries.
Standardization of Flameproof Distributing Frame Wire.
Improved Pole Changer.
Standard Floor Plan Arrangements for Telephone Buildings in Single Office Districts.

Equipment Matters—Continued

Standard Floor Plan Arrangements for One-Unit Telephone Buildings in Multi-Office Districts.
New Line and Cut-Off Relay.
Improved Supervisory Relay.
Switchboard Clock for "A" Positions.
Standard Specifications for Repaired Material.
Modified Nos. 38, 39 and 40 Terminal Strips.
Method of Wiring Condensers in Toll Cord Circuits.
[fol. 15593] New Transmitter Arms.
Circuit for Grouping "A" and Toll Switching Positions.
Changes in Equipment and Arrangement of No. 1 Trunk Switchboard Keyshelves.
Changes in Nos. 5 and 23 Induction Coils.
Alarm Signal for Main Discharge Fuses.
New Design of the No. 65 Terminal Strip for Horizontal Side of Main Distributing Frames.
Method of Handling Toll Calls from the New Type Prepayment Multi-Coin Boxes.
Use of Tungsten Lamps for Resistances in Coin Box Trunk Leads.
Revised Specifications for Simplex Sets.
Wiring of the Outgoing Trunk Multiple Directly to the Main Frame and Intermediate Type Terminal Strip for the Main Distributing Frame.
Peg Count Register Key.
New Standard Central Office Register—Lock-up Type.
Tool for Removing Worn No. 49 Jack Sleeves.
Direct Current Commutating Pole Motors for Charging Generators.
Gauges for No. 92 Jack Sleeves.
Machine Ringing—Premature Operation of Tripping Relays Due to Breakdown of Line Insulation.
Specifications for Message Register Generators.
Battery Boxes for Dry Cells—Use of Dry Cells for Morse Local Battery and Transmitter Local Battery.
Tool for Removing Lamp Caps Mounted on Close Centers.
Cord for Suspended Type Transmitter.
Supply Ringing Current over Cable Pairs to Private Branch Exchanges.

Equipment Matters—Continued

Standard Drop Light Handle on Guard for Use in Operating and Terminal Rooms.
Improved Operator's Telephone Set Cord.
[fol. 15594] Power Plant Wiring—Omission of Individual Cell Voltmeter Leads to Storage Batteries.
Emergency Plugging-Up Cords.
Pick-Up Alarm Circuits—Machine Ringing.
Improved Type "A" and "B" Composite Ringers.
Repair of Tinsel Switchboard Cords.
High Impedance Relay for Use in New Toll Cord Circuits.
Testing Circuit for Use in Connection with New Toll Cord Circuits.
Folding Handle for Emergency Hand Generators.
Machines for Cleaning Switchboard Plugs.
Automatic Keyshelf Brace.
Arrangement of Keyboard Lamp Caps and Guards and Pilot Lamp Caps and Guards.
Railroad Private Branch Exchange Equipment.
Oil Insulators and Pedestal Supports for Mounting Storage Batteries.
Improved Monitoring Arrangement for Operators' Telephone Sets.
Starters for Alternating Current Motors.
Improved Telegraph Key.
Glass Sand Trays and Glass Covers for Storage Batteries.
Methods of Handling Trouble Reports.
Improved No. 9 Switchboard.
Improved Local and Toll Service Observing Desks.
Specifications for Storage Batteries.
Specifications for the Care and Operation of Storage Batteries.
Primary Battery for Current Supply for Magneto Switchboards.
Improved Local Test Desk.
Improved Small Magneto Switchboards.
[fol. 15595] Redesigned 3 by 7 Cordless Private Branch Exchange.
Private Branch Exchange No. 550-A.
Improved Ringdown Trunk Circuits for Lines Exposed to Inductive Disturbances.

Equipment Matters—Continued

Improved Signaling for Ringdown Trunks.
Service Observing Circuit for No. 10 Switchboard.
Subscribers' Line Cabling and Jumper Wiring for Four-Party Jack per Station Lines.
Modification of No. 1 Private Branch Exchanges for Lamp Signals.
Automatic Call Circuit Selecting Arrangements.
Private Branch Exchange Cord Circuits for Use on Night Connections.
Circuits Employing Gang Keys.
Improved Waterproof Switchboard Cable.
Switchboard Cord Protector.
High Frequency Generator for Composite Signaling.
New Type of Switchboard Cable.
Improved Wire Chiefs' Desks.
Improvements in Small Common Battery Switchboards.
Small Toll Ticket Distributing Systems.
Composite Ringer Testing Set.
Improved Method of Terminating Phantoms.
Improved No. 2 and No. 10 Toll Cords.
Toll Service Observing Circuit for Repeaters.
Improved Double Pulley Cord Weight.
Improved Single Pulley Cord Weight.
Alarm Circuit for Message Register Machines.
Grouping Arrangements at "B" Positions.
"A" Operators' Cords to Give Busy Tests on Trunks.
[fol. 15596] Glass Window for Message Register Dust Caps.
Improvements in No. 84 Type Interrupters.
Improved Universal Key and Key Base Complete.
Improved Lamp Socket Mountings.
Investigation of Speed and Voltage Regulators.
Electrical Starting Equipment for Gas Engines.
Automatic Cell Fillers for Storage Batteries.
Parallel Operation of Mercury Arc Rectifiers.
Narrow Base Key for Manual Ringing Trunks.
Fibre Faced Jack Spaces.
Vacuum Tube Repeater Cord—Inductive.
Vacuum Tube Through Line Repeater Cord—Inductive.

Equipment Matters—Continued

Vacuum Tube Repeater Cord—Non-Inductive.
Vacuum Tube Through Line Repeater Cord—Non-Inductive.
Mechanical Repeater Cord—Inductive.
Mechanical Through Line Repeater Cord—Non-Inductive.
Emergency Repeater Cord.
Routine and Equipment for Handling Trouble Reports and Certain Associated Work.
Development of New Toll Cord Circuits to Replace the Present No. 2 and No. 10 Toll Cords.
Development of Trunk for Use Between Toll Board and Local Information Desk.
Mounting for Grouping Key and Emergency Call Circuit Key.
Reduction in Cost of Platinum Contacts.
Development of Magneto Switchboard with Combined Drops and Jacks.
Redesign of No. 32 Lamp Socket for Pilot Signals.
Repair of Switchboard Cords at the Switchboard.
New Design of Trunk Designation Strip.
[fol. 15597] Improved Trunk Operator's Telephone Set Circuit.
Subscriber's Set for Rural Stations.
Compact Subscriber's Set for Hotels.
Portable Set to be Carried on Street Railway Cars.
Standard Subscribers' Sets of Metal Construction.
Black Finish for Desk Stands and Ringer Gongs.
Standard Scheme for Tracer Colors in Desk Stand cords.
New Design of Terminal Rack and Cord Bushing of Desk Stands.
Improved Tinsel Conductors in Substation Cords and Other Changes in Braids and Terminals.
Standard Keys in Housing for Mounting at Substations.
Standard Dry Cell for Local Battery Telephones and Other Telephone Service.
Standard Gauge for Testing Dry Batteries.
Metal Box to Contain Dry Batteries at Local Battery Stations.

Equipment Matters—Continued

Standard Multi-Coin Collector Arranged to Take Nickels, Dimes and Quarters for Toll and Long Distance Calls on a Prepayment Basis.

New Single Coin Collector to Receive Nickels on a Prepayment Basis.

Investigation of Causes of Electrolytic Corrosion of Prepayment Coin Collector Windings in Service.

Standard Telephone System for High Class Residences Providing Inter-Communicating Service Between Sets and Regular Exchange Service.

New Four-Party Selective Ringing System Using Superimposed Ringing Current.

Standard Telephone Booth with Folding Doors.

Standard Signs for Telephone Pay Stations.

Standard Light Portable Test Set for Use of Linemen.

Standard Terminal Blocks for Making Connections to Inside Wire and Cords at Substations.

Equipment for Ventilating Telephone Booths.

[fol. 15598] Standard Plates for Attaching to Telephone Instruments.

Standard Methods for Economically Handling Transmitters and Receivers Removed from Substations.

Metal Telephone Booths.

New Loud Ringing Extension Bell Sets.

Standardization of New Spring Terminals and Standard Connectors for Dry Batteries.

Attachments Which May be Applied to Coin Collectors, Enabling the Collection of the War Tax on Telephone Messages.

Telephone Substation Equipment of Special Design for Service in Mines.

Improvement in Design of Mouthpiece of Operator's Transmitter.

Standard Methods for Adjusting Ringers.

Mounting for Protectors Exposed to Weather.

Improved Winding of Standard Substation Ringer.

New Finish for Breast Plates of Operators' Transmitters.

Development of Apparatus for Automatically Registering the Number of Telephone Calls at Coin-Collector Stations.

Equipment Matters—Continued

Self-Locking Cash Box.
New Head Band for Operator's Receiver.
Plug for Use in Connecting Portable Subscribers' Sets.
Development of Special Equipment for Use of United States Government in Coast Guard Service.
Telephone Equipment for Transmitting Speech to Large Public Gatherings.
Steel Desk Stand With Permanent Bower Barff finish.
Moistureproofing of Standard Desk Stand Cord.
Investigation of the Durability of Enamel in Comparison with Silk and Cotton as Insulation for Wire.
Investigation of Changes in Standard Substation Ringer.
New Method for Refinishing Repaired Desk Stands.
Desk Stand Bases with Longer Life for the Felt.
[fol. 15599] Small Test Board for Joint Offices.
Morse Storage Battery Fuse Panel.
Modification of "A" Operator's Cord Circuit to Facilitate Testing Outgoing Trunk Assignments.
Redesign of Trunk Operator's Busy Test Circuit.
Recall Signal for No. 601 Private Branch Exchange Trunks.
Toll Cord Circuit with Telephone Repeater.
High Efficiency Head Receiver.
Emergency Toll Equipment.
Emergency Switchboard Equipment.
Telephone Set for Railroad Offices.
Small Private Branch Exchange.
Steel Desk Stand.
Two-Frequency Four-Party Ringing.
Improved Private Branch Exchange Switchboard.
Improved Finish for Transmitters.
Revision of Circuits to Permit Use of Multiple Line Signals.
Ringing Generator for Superimposed Ringing.
Auxiliary Receiver.
New Common Battery Switchboard.
Gas Engine Equalizers.
Investigation of Cut-off Relays.

Equipment Matters—Continued

Telephone Repeater Cord Circuit for Emergency Use.

Operation of Morse Storage Batteries.

Direct Current Adjustment for Biasing Springs of Substation Bells.

Loud Ringing Extension Bell for Four-Party Selective Service.

United States Bureau of Standards Conference on Dry Cells.

[fol. 15600] Outside Plant Matters:

Preparation of Rules Governing the Economical Maintenance Replacement of Poles.

Consideration of Northwestern Cedar Men's Association Specifications for Cedar Poles.

Development of Specifications for Western Cedar Poles.

General Investigation of the Preservative Treatment of Poles and Crossarms and of Various Preservative Compounds.

Study of the Relative Economies of Treated and Untreated Poles for Use in Different Sections of the United States.

Analysis of Creosote Recovered from Poles in Service and Study of Changes in the Creosote with a View to Improving our Specifications.

Revision of Specifications for Creosote and Carbolineum.

Development of a New Method for Attaching Aerial Cables to their Supporting Strands by Metal Rings.

Revision of Standard Specifications for No. 19 and No. 22 Gauge Cable.

Modifications of Standard Methods of Aerial Cable Construction.

Development of 1200 Pair Cable.

Development of 900 Pair Cable.

Development of 300 Pair Submarine Cable.

Development of Improved Methods for Splicing Submarine Cable.

Outside Plant Matters—Continued

Introduction of Antimony Lead Alloy for Cable Sheaths.

Preparation of Standard Handbook of Exchange Aerial Construction Methods.

Determination of Proper Construction to Employ at Crossing Points of Telephone Lines over Railroad Right of Way and Standardization of this Construction with the Committee of Railway Telegraph Superintendents.

Study of the Extent and Range of Each Sleet Storm in the United States that has Seriously Affected the Telephone Plant.

[fol. 15601] Inspection and Study of Line Breaks to Determine what Changes, if any, Should be Made in Standard Specifications to Reduce Trouble of this Kind.

Development of a Cheaper Type of Twisted Pair Rubber Covered Outside Distributing Wire.

Determination of Proper Requirements for Insulation Resistance for Outside Distributing Wire and for Inside Wire for Substation Use.

Standardizing Best Type of Rubber Covered Wire for Potheads.

Development of a Small, Non-Hygroscopic Flameproof Wire for Use on Cross-Connecting Frames.

Development of Pothead Sealing Compounds.

Determination of Proper Method for Installing and Connecting Aerial Loading Coils.

Development of a Method for Making Phantom Circuit Transpositions.

Development of Methods for Making Pole Pair Phantom Transpositions.

Standardizing Methods of Long Span Construction for Open Wires.

Development of Electrolysis Bond Relay.

Development of an Improved Method for Testing Galvanizing on Iron and Steel.

Development of Improved Strain Insulators for Pole Guys.

Design of and Specifications for Tool Box for Cable Splicers and Small Maintenance Gangs.

Outside Plant Matters—Continued

Revision of Specifications for Vitrified Clay Duct to Enable the Utilization of a Greater Proportion of the Total Factory Output with a Saving in Cost.

Standardization of Hall Terminal for Use Inside of Buildings.

Development of Methods for Reinforcing Pole Butts.

Efficiency Tests of Commercial Forms of Patent Guy Anchors and Selection of the Most Serviceable Forms for Standardization.

Development of a Cheaper Crossarm Brace.

[fol. 15602] Development of Standard Specifications for Underground Conduit Construction Embodying Improved Practices.

Investigation Resulting in Reduction in Diameter and Cost of Standard Underground and Aerial Cables.

Standardizing Methods of Installing Underground Cables.

Development of Trouble Locating and Test Sets for Cable Repairmen and Cable Splicers.

Revision of Specifications for Splicing Cables to Cover New and Improved Methods.

Determination of Best Methods for Making Joints in Iron Wire.

Investigation of the Economy of Latticed Steel Poles.

Development of a New Aerial Type of No. 22 B & S. Gauge Cable.

Preparation of Specifications for High Strength Toll Aerial Cable Lines.

Determination of Best Method of Terminating Paper Insulated Cables at Central Office or Inside Buildings.

Improvement in Outside Distributing Terminals.

Development of Improved and Cheaper Type of Protected Cable Terminal.

Studies of Possible Modifications and Economies in Standard Line Construction for Use where Weather Conditions are Not Severe.

Study of Construction to be Proof Against Very Severe Storm Conditions.

Revision of Specifications for Exchange Aerial Construction.

Outside Plant Matters—Continued

Connecting Sleeves for Copper Wire.

Revision of Instructions Governing the Use of Dynamite.

Investigation of Alternative Forms of Insulator Pins.

Investigation of the Merits of Dry Galvanizing for Use on Pole Line Hardware.

Investigation to Determine the Best Materials and Methods for Insulating Joints in Rubber Covered Wire.

Improvements in Insulated Wires and in Interior Locations.

[fol. 15603] Investigation of the Comparative Economies of Different Materials Used for Supporting Aerial Cables.

Revision of Specifications for Joint Use of Poles by Telephone and Light and Power Companies.

Specifications for Placing House Cables.

Revision of Specifications for Creosoted Yellow Pine Poles and Reinforcing Stubs.

Development of High Dielectric Strength Strain Insulators.

Standardization of Plant Engineering Records.

Investigation of the Available Formulae for Calculating the Stability of Poles Set in Earth.

Revision of Specifications for Block Wiring.

Switch for Making Transpositions in Working Open-Wire Circuits.

Development of Thimble Guy Rod.

Improved Line Insulator.

Bulletin on Results of Pole Treatment.

Connecting Blocks for Toll Cable Terminals.

Development of Test Connectors.

Preparation of Bulletin on Electrolysis Mitigation.

Bulletin on Sags and Tensions of Suspension Strands.

Development of Specifications for 17 Gauge Bronze Outside Distributing Wire.

Effects of Stray Currents on Paper Insulation of 24 Gauge Cables.

Resistance of Cable Sheaths.

Outside Plant Matters—Continued

Investigation of Sealed Chamber Terminal for Junction of Open-Wire Lines and Cables.
Study of Angle Insulator.
Ground Connections.
Reinforced Concrete Crossarms.
[fol. 15604] Study of Sleet Storm Conditions in the United States.
Development of Combination Guy and Suspension Clamp.
Cable Splicers' Test Set for Use in Machine Switching Exchanges.
New Method of Crating Loading Coils.
New Method of Marking Terminals.
New Method of Installing Apparatus Needed at Junction of Cable and Open-Wire Lines Used for Carrier.
Development of Improved Forms of:
Grade Clamp.
Bridle Wire Insulation.
Houseline.
Cable Clamps.
Clamps for Ground Wires.
Strain Plates.
Guy Rods.
Pipe Straps.
Shovels and Digging Spoons.
Porcelain Tubes.
Aerial Cable Splicer's Tent.
Balconies for New Type Cable Terminals.
Pole Seat.
Bridle Rings.
Cable Extension Arms.
Reinforcing Strap.
Transposition Running Board.
Furnace Shields.
Porcelain Strain Insulators.
Wax Thermometer.
[fol. 15605] Guy Chains.
Tinned Steel Sleeves.
Messenger and Guy Strand.
Iron Wire.
Rock Guy Bolts.

Outside Plant Matters—Continued

Pipe Cap Molds.
Lineman's Body Belt and Safety Strap.
Guy Guards.
Clamps for 2200 Pound Strand.
Pole Steps—Long Head.
Manhole Frames and Covers.
Cant Hooks.
Conduit Castings.
Strain Insulator Clamps.
Pole Jacks.
Pike Poles.
Fanning Strips.
Terminal Tag.
Terminal Clamps.
Renumbering Strips.
Binding Posts.
Terminal Drip Pan.

[fol. 15606] Transmission and Protection Matters:

Interference to Telephone Lines from High Speed Telegraph Circuits.
Interference from High Tension Transmission Lines Having Grounded Neutrals.
Experimental Determination of Crosstalk on Transposed Lines.
Preparation of a Bulletin on Noise and Inductive Disturbances.
Transmission Losses, Common and Local Battery Sets.
Determination of Reflection Losses.
Dielectric Losses in Paper Cable.
Determination of Attenuation and Reflection Constants of Loaded Cable.
Development of Duplex Cable.
Experimental Determination of Possibilities of Telegraphing Through Cables.
Design of Submarine Loading Coils and Pots for Loading Three Important Submarine Cables.
Design and Development of Cable and Loading Coils for the Underground System Between Boston and Washington.
Development of Improved Condensers.

Transmission and Protection Matters—Continued

Improvement of Insulation of Open-Wire Circuits.
Portable Bridge for Measuring the Impedance of Telephone Circuits and Apparatus with High Frequency Currents.
Systems of Transpositions for Phantom Circuits.
Loading No. 8 Gauge Circuits.
Investigation of Vacuum Arresters for Telephone Protection.
Transposition System for Joint Telephone and Telegraph Lines.
Determination of Resistance Limit for Central Office Ground.
Phantoming of Loaded-Circuits.
Use of Amplifiers in Telephone Measurements.
Development of Transmission Measuring Set for Routine Use.
Development of Telephone Repeaters for Commercial Use.
[fol. 15607] Special Field Trial of Long Distance Wireless Telephone and Telegraph.
Development of Phantom Circuit Repeating Coils.
Studies of Phantom Loading Coil Design.
Development of Equipment for Phantoming Rural Subscribers' Lines.
Improvement in Terminal Cables for Duplex Loading Coil Cases.
Studies of Special Irons for Use in Loading Coil Cores.
Development of Improved Induction Coils.
Development of Autotransformers for Duplex Circuits.
Development of Test Sets for Measuring Alternating Current Constants of Coils in the Field and for Demagnetizing Magnetized Coils.
Development of Improved Repeating Coils having High Stability and High Grade Ringing and Transmission Efficiency.
General Development of Improved Types of Loading Coils and Pots for Use on Open-Wire Lines, Large Gauge Cables and Small Gauge Cables.
Development of Coils for Composite Sets.
Development of Coils for Polar Duplex Sets.

Transmission and Protection Matters—Continued.

Development of Coils for Morse Generator Taps.
Development of Shielded Phantom Repeating Coils.
Field Experiments on Improved Substation Protector.
Improved Alarm Fuses.
Improvement of Central Office Heat Coils.
Improvement of Fuses Used for Substation Protection.
Redesign of Central Office Main Frame Protector.
Development of Method for Cleaning Carbon Protector Blocks so as to Reduce the Cost of Maintenance.
Transmission Improvement of Heat Coils for Magneto Offices.
Development of Protective Apparatus for Use on Telephone Lines Leased for the Operation of Foreign Signaling Systems.
Preparation of Bulletins on Transmission Equivalents.
Development of Improved Compensating Transformers.
[fol. 15608] Development of Apparatus and Methods for Detecting Abnormal Resistance at Heat Coil Contracts and for Reducing Such Resistance.
Preparation and Distributon of Handbook of Standard Transposition Systems.
Cooperating with Engineers of N. Y., N. H. & H. R. R. Co. and Westinghouse Co. in Reducing Interference from Electrified Railway.
Application of Compensating Transformers to Telephone Circuits for the Purpose of Reducing Electromagnetic Interference from Paralleling Single-Phase Railway Systems.
Regulator for Potentials of Ground Connections.
Preparation and Distribution of a Set of Notes on Transmission Maintenance.
Preparation of a Bulletin on Loading Telephone Circuits.
Transmission Work in Connection with Telephone and Telegraph Facilities Required by the United States Government, particularly for the Use of the Army and Navy.

Transmission and Protection Matters—Continued

Portable Composite Set.
Compensating Transformer — Improvement in Transmission Efficiency.
Non-Inductive Type Repeater Circuits.
Development of Loading Coils with Cores Having Air Gaps.
Attenuation Equalizer for Submarine Cables.
Re-design of Protector No. 61 and Protector Mounting No. 2.
Development of Noise Standard for Field Use.
New Retardation Coil for Artificial Line—Duplex Telegraph Set.
Transmission Losses Caused by Multipling Trunk Circuits.
Test of Filters as Lightning Protectors.
Use of Telephone Repeaters Equipped with Special Apparatus to Improve the Attentuation—Frequency Characteristics of Circuits.
Investigation of Heat Coil Protection of Magneto Substations.
[fol. 15609] Deterioration of Paper Condensers.
Development of High Efficiency Phantom Transformer Coils.
Network of No. 8 Gauge Circuits Equipped with Telephone Repeaters Connecting all Important Cities of the United States.
Use of Telephone Repeaters on Call Circuits.
Development of Improved Methods for Noise Investigations.
Development of Special Assembly Methods of Cable Loading Coils for Use on Four-Wire Telephone Repeafer Circuits.
Development of Loading Coils Suitable for "Carrier Current" Operation.
Inductive Disturbances from High Tension Lines.
Preparation of a Bulletin on Protection Against Foreign Potentials.
New Types of Loading Units for Phanton Loading.
Cable Loading Coils with Coils Having Air Gaps.
Grounding Aerial Cable Sheaths.

Work has also been completed on about 800 other subjects.

[fol. 15610] TOLL CASE—RHODES EXHIBIT 88

Some Cases of Work on Hand

(Plant Matters Only. Traffic and Commercial Problems Not Included)

Equipment Matters:

Automatic Service Testing Equipment (Multi-line Service Observing).
Central Office Battery Noises.
Small Toll Ticket Distributing System.
Fire Extinguishers.
Improved Head Band for Operator's Receiver.
Waterproof Switchboard Plugs.
Common Battery Circuits for Use in Duplex Cables.
Improved Composite Ringer.
New Wire Chief's Desk.
Improved Case and Cap for No. 144 Receiver.
Central Office Grounds and Ground Leads.
Improved Ringer for Common Battery and Magneto Service.
Improved Operating Room Desks.
Audible Signal for Use with Answering Supervisory Lamps.
Duplex Telegraph System for Loaded Cables.
Gas Engines.
Improved Signaling Method for Toll Circuits.
General Study of Telephone Receivers.
Regulation of Central Office Storage Battery Voltage.
Automatic Private Branch Exchange.
Development of Small Common Battery Switchboard.
Centralized Test Desk.
Improved Service Observing Plug.
[fol. 15611] Dry Battery for High Resistance Transmitters.
Improved Trunking Arrangements for Common Battery Manual Switchboards.
Sensitive Alternating Current Relay.
Energy Supply for Message Registers.
Central Test Desk for Locating Faults in Cables.
Improved Desk Stand.
Machine Switching Substation Equipment.
New Operator's Transmitter.

Equipment Matters—Continued

Apparatus for Determining the Efficiency of Transmitters, Receivers and Induction Coils.
Private Branch Exchange Equipment for Use with Full Mechanical Central Offices.
Development of Sound-Proof Telephone Booths.
Emergency Power Equipment for Small Offices.
Arrangement of Storage Batteries for Machine Switching Offices.
Power Equipment for the Selector in Machine Switching Offices of the Panel Type.
Mercury Arc Rectifiers for Machine Switching Offices.
Charging Machines and Accessory Equipment for Machine Switching Offices.
Improved Dial for Machine Switching.
Repairmen's Hand Set for Use in Machine Switching Exchanges.
Improvements in Storage Batteries and Accessory Equipment.
Ringing Interrupter for Magneto Offices.
Power Plants for Private Branch Exchanges.
Equipment Installed in Manual Offices to Handle Calls from and to Full Mechanical Offices.
Circuit and Apparatus Development for Full Mechanical Central Office Equipment of the Panel Type.
[fol. 15612] Maintenance Equipment and Methods for Full Mechanical Central Office Equipment of the Step-by-Step Type.
Improved 202 Type Selector.
Circuit Arrangements for Tandem Systems.
Development of Drive Mechanism for Panel Type Offices.
Development of Operators' Calling Devices.
Four-Wire Telephone Repeater Equipment for Long Toll Cables.
Four-Wire Telephone Repeater Equipment for Short Toll Cables.
Metal Stay Hooks and Solderless Tips for Desk Stand Cords.
Substation Installers' Leather Bag.
Substation Repairmen's Satchel.

Equipment Matters—Continued

Standard Saw for Substation Installers.
Linemen's Test Set No. 17—Improvements in Design.
Redesign of Standard No. 2 Booth.
Standard Tool for Removing Floor Boards.
Standard Cable Stripper for Small Diameter Cable.
Automatic Ribbon Shift for Calculagraphs.
Redesign of No. 43 Subscriber's Set for Housing Extension Ringers.
Development of Weather-proof Telephone Booth.
Development of Steel Telephone Booth.
Development of Special Booth for Use in United States Government Buildings.
Substation Equipment to Obtain Increased Ringing Range on Subscribers' Loops.
Call Circuit Maximum Facilities at "A" Positions.
Improved Intercommunicating System for Residence and Business Service.
Cable Splicer's Talking Set.
Substation Equipment for Deaf Persons.
[fol. 15613] Equipment for Training Operators in Handling Calls between Manual Central Offices and between Manual and Machine Switching Systems.
Service Observing Equipment for Telephone Company Commercial Offices.
Seals, Seal Presses and Locking Key Rings Used in Making Collections from Pay Stations.
Improved Baking Japan.

[fol. 15614] Outside Plant Matters:

Pole Butt Reinforcements.
Improvements in Connecting Blocks.
Trouble Locating Set for Cable Repairmen.
Improvements in No. 14 Cable Terminals.
Development of Improved Electrolysis Bond Relay Switch.
Cable Splicer's Test Set.
Investigation of Wiping Solder.
Work with the American Committee on Electrolysis.
High Dielectric Strength Underground Cable.
Study to Determine the Cause and Remedy for Ring Cuts.

Outside Plant Matters—Continued

Development of 27 Gauge Cable.
Insect Injury to Cable Sheath.
Amplifier and Exploring Coil for Locating Cable Troubles.
Portable Pole Treating Plant.
Preservation of Poles—Closed Cylinder Treatment.
Preservation of Poles—Open Tank Treatment.
Preservation of Poles—Brush Treatment.
Development of Strand Pulling Tool.
Development of Blackburn Clamping Devices.
Development of 3 and 1 Point Transposition Brackets.
Reducing the Capacity Unbalances in 22 Gauge and 24 Gauge Cables.
Development of 24 Gauge Cable for Aerial and Block Use.
Tests on Improved Line Insulating Devices.
Development of Watertight Plugs for Submarine Cables.
Development of a New Type of Concrete Pole.
Development of Bends for Pole Laterals.
[fol. 15615] Improved Pole Seat.
Development of Standard Tools and Appliances for Underground Cable Construction.
Development of First Aid Appliances and Materials.
Apparatus for Testing the Integrity of Cable Sheath and for Drying Cables which are in Use.
Improvement of Wooden Cable Terminal Boxes.
Overcoming Defects which Occasionally Occur with Present Methods of Making Wire Joints at Splices in No. 19 Gauge Cables Used for Phantom or Repeater Circuits.
Developing a Tool for Twisting Pair Joints in Cable Splicing.
Design of Pole Treating Plant.
Study of the Effect of the Temperature and Duration of the Heating Bath on the Strength of Open Tank Treated Timber.
Rawlplugs.
Standardization of Textile Insulated Lead Covered Cables.
Scrulix Guy Anchors.

Outside Plant Matters—Continued

Specifications for Submarine Cables.
Balancing Stubs and Building out Stubs.
Development of Steel Towers and Supports for Radio Purposes.
Development of anhole Locating Test Set.
Development of a Buzzer-Battery Test Set.
Improved Method of Attaching "B" Terminal Braces to the Box.
Improvements in Present Types of Underground—Aerial Cable Terminals.
Improvements in Present Types of Distributing Terminals.
Investigation of Sherardized Hardware.
Method of Strengthening Corner Joints in No. 23 Terminal Doors.
Specifications for Quadded Land Cables.
Specifications for Composite, Non-Quadded Cables.
[fol. 15616] Study of Matthews Spragun Painting Machine.
Development of Improved Method of Applying Insulating Material to Wires in Cables.
Improvements in Dielectric Strength of Cable Terminal Stubs.
Development of More Economical Distributing Frame Wire.
Development of More Economical Inside Wire.
Development of More Economical Bridle Wire.
Fibre Strength of Pole Timbers.
Investigation of Zeller Process.
Apparatus for Fuse Protection between Aerial and Underground Cables.
Cable Loading Coil Cases for Loading Units Containing New Phantom Coil No. 587.
Development of Built-up Crossarm and Pin System.
Stub Reinforcement for Poles—Strap Type.
Investigation of the Preservative "Aczol."
Use of Desilverized Lead in the Manufacture of Cable Sheath.
Multiple Unit Cable.
Capacitance Uniformity in Quadded Cables.
Development of Improved Forms of:
Aerial Cable Grips.

Outside Plant Matters—Continued

Manhole Lighting Set.
Linemen's Hammers.
Emergency Wire Reel.
Lead Sleeving.
Manhole Gaskets.
Manhole Guards.
Load Coil Supports.
Strand Cutter.
[fol. 15617] Paper Insulated Emergency Cable.
Wire Braids.
Motor Lubricating Oils.
Rubber Insulated Quadded Emergency Cable.
River Crossing Arms.
Insulator Pin Gauges.
Ladders.
Crossarm Spacing Blocks.
Cable Rings.
Tree Trimmers.
Draw Knife.
"Pull" Finder.
Pliers.
Rock Anchors.
Guy Shields.
Concrete Poles.
Duct Rodding Tools.
Vitrified Clay Conduit.
⅝ Inch Steel Pins.
Slack Puller.
Bridle Wire Insulator.
Solder Ladle.
Cable Bender.
Tool for Making Cable Ties.
Splicers' Furnaces.
Steel Numbering Die.
Splicers' Platforms.
[fol. 15618] Tackle Blocks.
Trouble Locating Set for Use on Open Wire Lines.
Bridging Connector.
Cross-Connecting Aerial Cable Terminal.
Tension Indicator for Support Strand.

[fol. 15619] Transmission and Protection Matters:

Improved Operator's Telephone Set.
Use of Auto-Transformers for the Reduction of Reflection Losses.
General Repeater Study.
Magnetization of Loading Coils.
Redesign of Substation Circuit.
Interference from High Voltage Direct Current Railways.
Interference from Single Phase Railways.
Study of Wireless Telephone and Telegraph Matters.
Transpositions for Parallel Power and Telephone Circuits.
Interference from Wireless Telegraph Stations.
Improved Open Space Cutout for Substation Protection.
Development of Portable Source of Variable High Frequency Currents.
Loading of Toll Entrance Cables.
Protectors for Potentials over 5,000 Volts.
Portable Loading Coil Test Sets.
Use of Four-Wire Telephone Circuits Equipped with One-Way Repeaters for Toll Cable Working.
Wave Shapes of Current and Voltages in Power Circuits.
Inequality Ratio Repeating Coils Having High Ringing Efficiency.
Study of the Characteristics of Speech.
Adjusting the Capacity of Loaded Cable for Repeater Operation.
Improvement of Transmission Efficiency of Central Office Heat Coils.
Multiplex Telephony and Telegraphy by the Use of Carrier Currents over Wires.
The Effect of Noise on the Intelligibility of Telephone Conversations.
[fol. 15620] Theoretical Study of Transients.
Uniform Transmitting and Receiving on Subscribers' Loops of Varying Length.
Field Investigation of "Flutter Effect."
Crosstalk in Cable Circuits.

Transmission and Protection Matters—Continued

Induction into Cable Circuits.
Investigation of the Amount and Distribution of Noise at Subscribers' Stations.
Transposition Systems and Special Conductor Arrangement for Open-Wire Circuits Carrying High Frequency Currents.
Balancing of Composite Sets for the Prevention of Noise and Crosstalk.
Investigation of Induction into Open Wire Circuits under Joint Use Conditions.
Methods for Determining the Transmission Efficiency of Substation Sets, Operators' Sets and Substation Loops in Service.
Use of Alternating Currents within the Voice Frequency Range for Signaling.
Investigation of the Magnitude and Distribution of Telephone Circuit Unbalances and of Their Effects on Noise.
Theoretical Studies in Wave Propagation.
Cable Loading Systems for Carrier Circuits.
Transmission Design of Call Circuits.
Loading Coils for Local Trunk Cables.
Transmission Design of Local Trunks.
Transmission Study of Machine Switching Systems.
Battery Supply Transformers for Local Cord Circuits.
Crosstalk Measuring Set.
Noise Meter.
Electrical Networks.
Clearing Grounds in Porcelain Type Open Cutouts, Using 200 Volt Breakdown Test.
[fols. 15621-15670] Low Voltage Vacuum Arrester.
Alternating Current Wave Analyzer.
High Frequency Crosstalk Measuring Set.
Reduction of Unbalance in Loading Coils.
Carrier Telegraph System for Cable Use—Transmission Features.
Reflection Reducing Transformers for Carrier Circuits.
Investigation of Practice of Bonding Aerial Cable Sheath to Underground Cable Sheath.

Transmission and Protection Matters—Continued

Inductive Interference Due to Transient and Low Frequency Currents and Voltages in Power Systems.
Cooperation with Inductive Interference Committee of American Railway Association.
Interference with Carrier Current Systems.
Effectiveness of Coordinated Power and Telephone Transpositions.
Relation of Noise at Circuit Terminals to Induction Measurements on Isolated Sections of Open Wire Lines.
Use of Earth Current Meter.
Development of Attenuation Equalizers for Short, Non-Loaded Cable Circuits—Transmission Features.
Fuse Protection Between Aerial and Underground Cables.
Transmission Design of P. B. X. Circuits.

Work is also on hand for more than 400 other subjects.

[fol. 15671] SERVICE CONNECTIONS CASE—COOPER EXHIBIT No. 6

The following indicates the average length of life in months for all classes of stations as computed in accordance with the two methods described heretofore, that is (a) terminated stations from January 1st, 1921 to May 31st 1921, inclusive, and (b) by analyzing 10% of the active stations, as of June 30, 1921.

	Average Life in Months			
	Cleveland	Columbus	Canton	Nelsonville
Terminated Stations	26.9	30.0	20.7	23.7
Active Stations	46.8	47.9	32.2	32.4

These data indicate that the rapid turnover of subscribers' stations is largely caused by the rapidity of movement within the short term class and emphasises the necessity for securing all reasonable protection against un-warranted service connection expense due to short term service users.

[fol. 15672]

COOPER EXHIBIT No. 9

SERVICE CONNECTIONS CASE

Cleveland Exchange

Summary of Expense Per Service Connection

	Commercial	Accounting	Traffic	Plant	Total
Establishing Service:					
1-Instruments not in place					
Main Station and PBX Trunk	1.57	.34	1.71	1.57	5.19
Extension and PBX Stations	.90	.13	....	.93	1.96
2-Instruments in place					
Main Station and PBX Trunk	1.57	.34	1.71	4.74	8.36
Extension and PBX Stations	.90	.13	....	2.80	3.83
Discontinuance of Service:					
Main Station and PBX Trunk	.87	.33	3.02	6.49	10.71
Extension and PBX Stations	.64	.13	....	4.88	5.65
Total Service Connections:					
1-Instruments not in place					
Main Station and PBX Trunks					15.90
Extension and PBX Stations					7.61
2-Instruments in place					
Main Station and PBX Trunk					19.07
Extension and PBX Stations					9.48

[fol. 15673]

SERVICE CONNECTIONS CASE—COOPER EXHIBIT No. 10

Columbus Exchange

Summary of Expense Per Service Connection

	Commercial	Accounting	Traffic	Plant	Total
Establishing Service:					
1-Instruments not in place					
Main Station and PBX Trunk	1.24	.16	.77	2.14	4.31
Extension and PBX Stations	.63	.13	....	.57	1.33
2-Instruments in place					
Main Station and PBX Trunk	1.24	.16	.77	1.86	4.03
Extension and PBX Stations	.63	.13	....	.63	1.39
Discontinuance of Service:					
Main Station and PBX Trunk	.66	.18	.94	3.82	5.60
Extension and PBX Stations	.44	.11	....	3.70	4.25
Total Service Connections:					
1-Instruments not in place					
Main Station and PBX Trunk					9.91
Extension and PBX Stations					5.58
2-Instruments in place					
Main Station and PBX Trunk					9.63
Extension and PBX Stations					5.64

[fol. 15674]

SERVICE CONNECTIONS CASE —COOPER EXHIBIT No. 11

Canton Exchange

Summary of Expense per Service Connection

	Commercial	Accounting	Traffic	Plant	Total
Establishing Service:					
1-Instruments not in place:					
Main Station and PBX Trunk	1.77	.21	.86	.98	3.82
Extension and PBX Stations	.92	.17	....	.60	1.69
2-Instruments in place:					
Main Station and PBX Trunk	1.77	.21	.86	2.02	4.86
Extension and PBX Stations	.92	.17	....	.79	1.88
Discontinuance of Service:					
Main Station and PBX Trunk	.98	.24	.53	5.22	6.97
Extension and PBX Stations	.57	.15	....	5.08	5.80
Total Service Connections:					
1-Instruments not in place:					
Main Station and PBX Trunk	....	....	....	....	10.79
Extension and PBX Stations	....	....	....	....	7.49
2-Instruments in place:					
Main Station and PBX Trunk	....	....	....	....	11.83
Extension and PBX Stations	....	....	....	....	7.68

[fol. 15675]

SERVICE CONNECTIONS CASE—COOPER EXHIBIT No. 12

Nelsonville Exchange

Summary of Expense Per Service Connection

	Commercial	Accounting	Traffic	Plant	Total
Establishing Service:					
1-Instruments not in place:					
Main Station and PBX Trunk	1.58	.19	.58	.16	2.51
Extension and PBX Stations		No data available.			
2-Instruments in place:					
Main Station and PBX Trunk	1.58	.19	.58	.98	3.33
Extension and PBX Stations		No data available.			
Discontinuance of Service:					
Main Station and PBX Trunk	1.19	.22	.30	4.29	6.00
Extension and PBX Stations		No data available.			
Total Service Connections:					
1-Instruments not in place:					
Main Station and PBX Trunk	....	....	....	....	8.51
Extension and PBX Stations		No data available.			
2-Instruments in place:					
Main Station and PBX Trunk	....	....	....	....	9.33
Extension and PBX Stations		No data available.			

[fol. 15676] SERVICE CONNECTIONS CASE—COOPER EXHIBIT No. 13

Wiring Loss

The item "Wiring Loss", may be briefly explained as follows:

At the time of making a new installation the labor and material used by the Plant Department at the applicant's premises, are charged to a Plant Account, i.e., are capitalized, and at the time are not expense. However, when the telephone is removed this item is credited to the Plant Account, so that capital at no time includes items for installation not actually in service. At the time of making this credit to capital, the salvaged part of the installation is charged to a material and supplies account, and the balance is charged to expense until such time as it is to be re-used. That part of the capitalized cost of a new installation, which cannot later be salvaged, therefore, may be considered a deferred expense item. This expense or loss is represented largely by labor.

When telephones are re-installed, i.e., when telephones are placed where old wiring is in place and usable, the value of the wiring in place (including the original labor involved) is credited to expense and charged to the proper plant account. The result is a constant succession of debits and credits to expense from this source, and the net balance during any given period, is the amount of realized expense out of the original total capitalized costs above referred to as deferred items of expense. The net amount of this expense divided by the number of removals during the period gives the average wiring loss per station removed, and is a separable item of expense clearly attributable to station movement.

This item of wiring loss is shown on the following table for the territory of the Ohio Bell Telephone Company as operated by the former Cleveland Telephone Co. and Ohio Division of the Central Union Telephone Company.

	Year 1921	Total for period Jan. 1, 1917 to Dec. 31, 1931, inc.
Gross Wiring Loss	$517,853	$1,683,207
Gross Wiring Credits	218,532	651,820
Net Wiring Loss	299,321	1,031,387
Stations discontinued	80,752	340,847
Wiring Loss per Station discontinued	3.71	3.03

NOTE.—The composite wiring loss for the five years (1917-1921 inc.) was used in determining disconnect expense.

[fols. 15677-15678] IN SUPREME COURT OF THE UNITED STATES

STATEMENT OF POINTS UPON WHICH APPELLANT INTENDS TO RELY AND DESIGNATION OF PARTS OF RECORD TO BE PRINTED, PURSUANT TO RULE 13 OF THE RULES OF THE SUPREME COURT OF THE UNITED STATES—Filed November 20, 1936

The Ohio Bell Telephone Company, appellant in the above entitled cause, states that the points upon which it intends to rely in its appeal in said cause are as follows:

Use of Price Trends

(Assignments of Error Numbers 1, 2 and 3)

The Commission's valuation of appellant's intrastate property as of June 30, 1925 was based upon an inventory and appraisal. In contrast, for each of the years 1926 to 1933 the Commission fixed the value of appellant's property by the application of a price trend percentage to the total value of the intrastate property for the preceding year, plus net additions.

[fol. 15679] The valuations so arrived at for each of the years 1926 to 1933 deprived appellant of its property without due process of law in violation of the Fourteenth Amendment because:

(a) The valuations were fixed not by the exercise of judgment but by an arbitrary formula;

(b) The price trends were based on secret information, obtained from various sources, undisclosed to appellant and not offered or introduced in evidence;

(c) Appellant's written requests to examine and rebut this secret information were denied.

The amount of refunds was determined by a consideration of the Commission's value of appellant's property, its net income and fair rate of return in each such year. Thus, the Commission's value of appellant's property was one of the controlling factors in determining whether there should be refunds and if so, to what extent. Of the total refunds ordered, $10,462,787, with interest, represented claimed excess earnings for the years 1926 to 1932, inclusive, for which years the value of appellant's property was fixed by the use of the price trends referred to.

Disallowance of Expenses

(Assignments of Error 4, 5 and 6)

In finding appellant's net income for each of the years 1925 to 1933 the Commission excluded from appellant's allowable operating expenses large sums on account of (a) [fol. 15680] the annual expense of depreciation and (b) payments to the American Telephone and Telegraph Company for license contract services.

The Commission's action in these respects was arbitrary, unsupported by the evidence and amounted to a denial of due process of law in that:

(a) Depreciation Expense:

The Commission purported to base its allowance for the annual expense of depreciation upon appellant's retirement experience, that is, the cost of plant retired, less salvage. It used for such purpose appellant's net retirement losses for the three years and nine months immediately preceding June 30, 1925 and wholly disregarded appellant's known retirement losses experienced during the years 1925 to 1933, the period for which appellant's rates were under investigation. As the result, the Commission's allowance for the annual expense of depreciation was $8,067,266 less than the net cost to appellant of its intrastate plant retirements during the period for which the allowance was made.

The Commission's allowance for depreciation was also made in disregard of the evidence, which fully established the propriety of appellant's depreciation rates, based on the service live and salvage of its several classes of plant.

It was erroneous to base the amount of appellant's annual [fol. 15681] depreciation expense upon its retirement experience but if that basis was to be adopted, there was no justification for requiring appellant to absorb without reimbursement more than $8,000,000 of retirement losses due to the consumption of plant during said period.

If the retirement method of determining the annual expense of depreciation is to be used and depreciation accounting abandoned, no substantial reserve for depreciation is contemplated or will be created. In such event appellant should be permitted to earn on an undepreciated rate base.

(b) License Contract Payments:

Of appellant's total payments to American Telephone and Telegraph Company for 1925 to 1932, inclusive, for license contract services, the Commission disallowed more than $2,800,000 although the proof showed that the services were needed by and of benefit to appellant, and that the cost to the American Company of rendering such services was greater than such payments.

Refunds Improperly Ordered

(Assignments of Error Numbers 7 and 8)

The Commission's error in this respect was two-fold.

[fol. 15682] (a) Except for the undervaluation of appellant's property, the overstatement of its net income and, for 1926 and thereafter, the use of price trends based on secret information, no refunds could have been ordered.

(b) During the period covered by the Commission's refund orders a part of appellant's increased rates had been collected under bond conditioned to repay the portion of the increases found to be excessive. Under Ohio law no refunds could be ordered except with respect to appellant's rates thus collected. The amount of the refunds was determined arbitrarily, not with regard to the fair value of appellant's property and its net income referable to rates collected under bond, but by the use of accounting apportion-

ments bearing no relation to such value or net income. Thus, in making these apportionments, the Commission treated as bonded revenue more than $100,000,000 which was not in fact so collected and thereby required appellant to refund more than $4,000,000 of non-bonded revenue.

Further, as the result of this method refunds amounting to $409,127 were ordered in the toll system for 1925 and 1926 without any consideration of fair value of the toll property or the net income therefrom.

The method used was purely arbitrary, was arbitrarily [fol. 15683] applied in disregard of the evidence and resulted in a denial of due process.

Refusal To Fix Future Rates

(Assignments of Error Numbers 9 and 10)

The Commission's sole authority for the commencement of the company-wide inquiry is Section 614-23 of the General Code of Ohio, which authorizes the fixing of rates for the future only.

Although the Commission found that under its then existing rates, including those collected under bond, appellant had had excess earnings in each of the years 1925 to 1932 and ordered refunds for those years, it found that for the year 1933, the closing year of the investigation, appellant had had no excess earnings under such rates.

Nevertheless the Commission refused to approve appellant's then existing rates as its lawful rates for the future and summarily overruled appellant's written requests so to do.

The Commission having found facts requiring it to approve appellant's existing rates, its refusal to do so was a denial of due process.

Valuation

(Assignments of Error Numbers 11, 12 and 13)

The Commission's valuation of appellant's intrastate [fol. 15684] property was confiscatory in the following particulars:

(a) Omitted Real Estate:

On June 30, 1925 appellant owned seven parcels of real estate of an admitted value in excess of $500,000 purchased

as sites for telephone exchange buildings. Although on some of the parcels telephone buildings were then under construction and although all of them had been purchased before, and were within a reasonable time after June 30, 1925, actually used in appellant's telephone business, the Commission excluded all of the parcels from the rate base as of that date.

(b) Price Trends:

By adopting and applying the price trends above referred to the Commission evidently gave full weight to every fluctuation in price levels occurring between 1925 and 1933. Appellant's property could not be lawfully so valued. It resulted in a substantial undervaluation.

(c) Going Value:

In the finding of tentative value the Commission made a separate allowance of approximately $3,500,000 for the going value of appellant's property. In the finding of final value the Commission wholly eliminated this allowance and made no other allowance therefor. The existence of going value was established by competent evidence and admitted [fol. 15685] by the Commission. Failure to give recognition to this element of value either as a separate item or otherwise resulted in a denial of due process.

(d) Western Electric Prices:

The Commission found that the prices charged appellant by Western Electric Company for telephone apparatus were reasonable except for one price increase of approximately 10% effective November 1, 1930. The evidence showed and the Commission found that the profits made by Western in its Bell business were reasonable. The evidence also showed that the price increase of November 1, 1930 was necessary because Western, after having reduced its prices steadily during the years in controversy, had made a further price reduction in 1929 based upon an expected increase in business which did not develop.

What weighting was given to Western's prices in the Commission's trended property values for the years 1926 to 1933 is not disclosed, but it is apparent that for those years the Commission gave some weight to Western's decreasing prices and none to the necessary increase of November 1, 1930.

(e) Cost and Reproduction Cost:

The Commission in its valuation failed to give proper weight either to the reproduction cost new or to the actual cost of the property.

[fol. 15686] Overruling Appellant's Protests, Applications For Rehearing and Requests

(Assignment of Error Number 15)

Appellant filed with the Commission its protests and applications for rehearing with respect to each of the orders of the Commission. It also filed with the Commission three requests for leave to examine and rebut the undisclosed information on which the Commission's price trend percentages for the years 1926 to 1933 were based and three requests that the Commission fix its then existing rates as the just and lawful rates for the future. In these protests, applications for rehearing and requests appellant pointed out specifically the foregoing errors committed by the Commission and asserted that by reason thereof appellant had been deprived of its property without due process of law and denied the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

Designation of Parts of Record to Be Printed

Appellant further says that the parts of the record necessary for the consideration of the foregoing points and hereby designated for printing are as follows:

(1) All of the papers filed and orders entered to perfect an appeal of this cause to the Supreme Court of the United States, including:

[fol. 15687] (a) The petition for appeal (transcript* pages 19-22).

(b) The assignment of errors (transcript pages 23-31).

(c) The jurisdictional statement (transcript pages 32-52) setting forth the grounds upon which it is contended the Supreme Court of the United States has jurisdiction on appeal, omitting appendices A (transcript pages 53-116) and

*All page reference are to pages of the transcript as numbered by the Clerk of the Supreme Court of Ohio Consecutively from 1 to 15,676 inclusive.

B (transcript pages 117-189) thereto which are the same as items (2) (g) and (14) of this designation.

(d) The order allowing appeal (transcript pages 190-192).

(e) Statement to appellee calling its attention to Rule 12, paragraph 3 of the rules of the Supreme Court of the United States and the proof of service upon appellee of all of the foregoing papers (transcript pages 193-194).

(f) The citation to appellee and the return made thereon (transcript pages 195-196).

(g) Appellant's praecipe (transcript pages 197-249).

(h) Stipulation No. 1 entered into between the parties with reference to the elimination of certain issues and of certain evidence from the record upon appeal (transcript pages 250-251).

(i) Stipulation No. 2 entered into between the parties with reference to the inclusion in the record on appeal of certain of the exhibits from the so-called Chicago case in abbreviated form (transcript pages 252-253).

[fol. 15688] (j) Stipulation No. 3 entered into between the parties with reference to the proceedings in and the bonds given in the several separate rate proceedings before the Public Utilities Commission of Ohio which were consolidated by said Commission into Case No. 3307 upon its docket (transcript pages 254-297).

(k) Stipulation No. 4 entered into between the parties with reference to the elimination of certain evidence from the record as printed (transcript page 298).

(l) Any other stipulations filed in this cause.

(m) The bond for costs required by the order allowing appeal and the approval thereof (transcript pages 307-312).

(n) The supersedeas bond required by the order allowing appeal and the approval thereof (transcript pages 299-306).

(o) This statement of points upon which appellant intends to rely and designation of parts of record to be printed.

(p) Any designation of parts of record to be printed filed by appellee.

(2) The record of the proceedings in said cause before the Supreme Court of Ohio including:

(a) The docket and journal entries in said court in Causes numbered 24694, 24695, 25023 and 25065 (transcript pages 2-17).

(b) Petition in error in Cause No. 25065, as certified, including the exhibits thereto attached (transcript pages 316-715).

[fol. 15689] (c) Petition in error in Cause No. 25023 (Consolidated into Cause No. 25065), as certified, including the table of exhibits but omitting the exhibits thereto, all of which are included among the exhibits to petition in error No. 25065 (transcript pages 716-772).

(d) Petition in error in Cause No. 24695 (Consolidated into Cause No. 25065), as certified, including the table of exhibits but omitting the exhibits thereto, all of which are included in the exhibits to petition in error No. 25065 (transcript pages 773-798).

(e) The petition in error in Cause No. 24694 (Consolidated into Cause No. 25065), as certified, including the table of exhibits but omitting the exhibits thereto, all of which are included in the exhibits to petition in error No. 25065 (transcript pages 799-838).

(f) The order of the Supreme Court of Ohio consolidating said causes numbered 24694, 24695, 25023 and 25065 into Consolidated Cause No. 25065 (transcript pages 4-5, line 18).

(g) The opinion of the Supreme Court of Ohio deciding Consolidated Cause No. 25065 (transcript pages 839-902).

(h) The journal entry and mandate of said court entered upon such decision (transcript pages 8 beginning with line 15 and ending on page 9, line 12).

(i) Appellant's application for a rehearing (transcript pages 903-921).

(j) The order of said court denying the application for rehearing (transcript page 9, lines 13-19).

[fol. 15690] (3) The complete transcript of the docket entries of the Commission in Cause No. 3307, being a company-wide inquiry with respect to appellant's rates and services, entitled: "In the Matter of the Investigation and Inquiry of The Public Utilities Commission of Ohio Upon Its Own Motion, for Determination (a) Of the value of the property of The Ohio Bell Telephone Company toll and exchange, (b) of the just and reasonable rates, and (c) of reasonable rules and regulations for service furnished by said company to its patrons throughout the State of Ohio" as contained in the record of this cause before the Supreme Court of Ohio (transcript pages 922-947).

(4) A complete transcript of the docket entries of the Commission in each of the Advanced Utility Rate Proceeding cases consolidated by said Commission with said company-wide case No. 3307 (transcript pages 978-1027).

(5) A complete transcript of the docket entries of the Commission in each of the so-called S cases, being separate cases consolidated into said case No. 3307 (transcript pages 948-966).

[fol. 15691] (6) A complete transcript of the docket entries of the Commission in case No. 3181, sometimes known as the "Hubbard Complaint" and consolidated into said case No. 3307 (transcript page 967).

(7) A complete transcript of the docket entries of the Commission in case No. 1368 relating to telephone rates in Columbus, Ohio, and consolidated into said case No. 3307 (transcript pages 968-970).

(8) A complete transcript of the docket entries of the Commission in case No. 1900 relating to telephone rates in Columbus, Ohio, and consolidated into case No. 3307 (transcript pages 971-974).

(9) A complete transcript of the docket entries of the Commission in case No. 1728 known as the "Service Connection Charge Case" and consolidated into said case No. 3307 (transcript pages 975-977).

(10) The order of the Commission of October 14, 1924, instituting the company-wide investigation No. 3307 and consolidating therewith the then pending separate cases (transcript pages 1028-1033).

[fol. 15692] (11) The Commissions tentative finding of January 10, 1931 (transcript pages 1034-1063).

(12) The Commission's order of January 10, 1931, tentatively fixing value (transcript pages 1064-1068).

(13) The protest of appellant filed with the Commission February 7, 1931, to the order of January 10, 1931, tentatively fixing value (transcript pages 1069-1072).

(14) The Commission's finding of January 16, 1934 (transcript pages 1073-1145).

(15) The Commission's order of January 16, 1934 (transcript pages 1146-1151).

(16) Appellant's application, filed with the Commission February 6, 1934, for rehearing of the Commission's order of January 16, 1934 (transcript pages 1152-1176).

(17) The application and request of appellant filed with

the Commission on February 17, 1934 (transcript page 1177).

(18) The Commission's order of March 1, 1934 (transcript pages 1178-1181).

[fol. 15693] (19) Appellant's application, filed with the Commission March 19, 1934, for rehearing of the Commission's order of March 1, 1934 (transcript pages 1182-1212).

(20) The Commission's order of March 9, 1934, overruling appellant's application for rehearing of the order of March 1, 1934 (transcript page 1213).

(21) The Commission's order of July 5, 1934 (transcript pages 1214-1217).

(22) The Commission's order of July 9, 1934 (transcript page 1218).

(23) The application and request of appellant of July 31, 1934, with respect to the Commission's order of July 5, 1934 (transcript pages 1219-1226).

(24) The application and request of appellant of July 31, 1934, with respect to the Commission's order of July 9, 1934 (transcript pages 1227-1230).

(25) The verified return of appellant, filed with the Commission July 31, 1934, to the order to show cause contained in the Commission's order of July 5, 1934 (transcript pages 1231-1285).

[fol. 15694] (26) The verified return of appellant, filed with the Commission July 31, 1934, to the order to show cause contained in the Commission's order of July 9, 1934 (transcript pages 1286-1339).

(27) Appellant's protest and application, filed with the Commission July 31, 1934, for rehearing of said orders of July 5 and 9, 1934 (transcript pages 1340-1382).

(28) Appellant's protest and application for rehearing filed with the Commission August 29, 1934 (transcript pages 1383-1388).

(29) The Commission's order of September 6, 1934 (transcript pages 1389-1394).

(30) Appellant's application and request of September 25, 1934, with respect to the Commission's order of September 6, 1934 (transcript pages 1395-1401).

(31) The Commission's order of September 27, 1934 (transcript pages 1402-1403).

[fol. 15695] (32) Appellant's protest and application, filed with the Commission October 1, 1934, for rehearing of

the Commission's order of September 6, 1934 (transcript pages 1404-1459).

(33) The Commission's order of October 19, 1934, overruling appellant's application and protest with respect to said order of September 6, 1934 (transcript page 1460).

(34) The stipulation filed with the Commission December 20, 1932, wherein there was stipulated into the record in Cause No. 3307 certain evidence and exhibits theretofore introduced in the so-called Chicago case entitled "Illinois Bell Telephone Company, plaintiff vs. G. Gale Gilbert et al., defendants", in the District Court of the United States for the Northern District of Illinois, Eastern Division, it being cause No. 3746 in said court (transcript pages 1461-1464).

(35) Include in said printing the entire transcript of the oral testimony in the company-wide case (transcript pages 1465-6238) otherwise known as "In re: Investigation and Inquiry of the Public Utilities Commission of Ohio upon its own motion for the determination of the value, rates, [fol. 15696] rules and regulations for service furnished by The Ohio Bell Telephone Company" and numbered 3307 on the docket of said Commission, omitting only the testimony of Frank R. McBerty which appears on the following pages of the transcript as certified:

Beginning with line 1, page 4736, and ending at the bottom of page 4852;

Beginning with line 1, page 4885, and ending at the bottom of page 4957;

Beginning with line 1, page 5233, and ending at the bottom of page 5333;

Beginning with line 1, page 5406, and ending at the bottom of page 5474.

(36) Also include in said printing the entire transcript of the stipulated oral testimony from the Chicago case (transcript pages 6239-7869) entitled "Illinois Bell Telephone Company vs. Gilbert" appearing in the printed volume known as "Abstract", omitting only:

[fol. 15697] (a) The testimony of Lambert N. Whitney beginning on page 6303 and ending on page 6307.

(b) The testimony of Allen B. Crunden beginning on page 6308 and ending on page 6316.

(c) The testimony of G. W. Cummings beginning on page 7125 and ending on page 7275.

(d) The testimony of J. G. Wray beginning on page 7542 and ending on page 7626.

(e) The testimony of Robert W. Burgess appearing on page 7863.

(37) Include in said printing the entire transcript of oral testimony in the so-called toll case, (transcript pages 7870-9716) otherwise known as Advanced Utility Rate Proceeding No. 124 on the docket of said Commission and entitled: "In re: Proposed Increased Rates and Charges of The Ohio Bell Telephone Company for Telephone Toll Service Between Points in the State of Ohio Filed to Become Effective January 21, 1924" which was consolidated into said company-wide case No. 3307, omitting only the testimony of W. F. Sloan beginning on page 8459 and ending on page 8579 of the transcript as certified.

(38) Include also in said printing the testimony of Charles P. Cooper, pages 9941 to 9978, inclusive, of the transcript as certified (hearing of February 2, 1922, part 2), [fol. 15698] in the so-called "Service Connection Charge Case", being No. 1728 on the docket of said Commission entitled: "In the Matter of the Investigation by the Commission Upon Its Own Initiative In re: Service Connection Charges and Charges for Moves and Changes of Telephone Companies" which was consolidated by said Commission into said company-wide case No. 3307.

(39) Include also in said printing the following exhibits or portions thereof from said company-wide case No. 3307:

Allensworth Exhibit 1 (transcript pages 10,095-10,097).
Allensworth Exhibit 3 (transcript pages 10,162-10,237).
Allensworth Exhibit 4 (transcript pages 10,238-10,301).
Anthony Exhibit A4 (transcript page 10,311).
Brett Exhibit 1 (transcript pages 10,312-10,318).
Brett Exhibit 2 (transcript pages 10,319-10,324).
Brett Exhibit 3 (transcript pages 10,325-10326).
Brett Exhibit 4 (transcript pages 10,327-10,328).
[fol. 15699] Brett Exhibit 5 (transcript pages 10,329-10,335).
Brett Exhibit 6 (transcript page 10,336).
Brett Exhibit 7 (transcript page 10,337).
Brett Exhibit 8 (transcript pages 10,338-10,350).
Brett Exhibit 9 (transcript pages 10,351-10,359).
Company Exhibit A (transcript page 10,789).

Company Exhibit X2 (transcript page 10,790).
Company Exhibit X3 (transcript pages 10,791-10,792).
Company Exhibit AA1 (transcript pages 10,793-10,795).
Company Exhibit AA2 (transcript page 10,796).
Company Exhibit AA3 (transcript pages 10,797-10799).
Commission Exhibit A1A (transcript pages 10,800-10,808).
Cooper Exhibit A1 (transcript pages 10,809-10,810).
Cooper Exhibit A2 (transcript pages 10,811-10,812).
Cooper Exhibit A3 (transcript page 10,813).
Cooper Exhibit A4 (transcript pages 10,814-10,835).
Cooper Exhibit A5 (transcript page 10,836).
Cox Exhibit A1 (transcript pages 10,847-10,866).
Cox Exhibit A2 (transcript pages 10,867-10,872).
[fol. 15700] Cox Exhibit A3 (transcript pages 10,873-10,884).
Cox Exhibit A4 (transcript page 10,885).
Cox Exhibit A5 (transcript page 10,886).
Cox Exhibit A6 (transcript pages 10,887-10,895).
Cox Exhibit A7 (transcript pages 10,896-10,901).
Cox Exhibit A8 (transcript pages 10,902-10,906).
Cox Exhibit A9 (transcript page 10,907).
Cox Exhibit A10 (transcript page 10,908).
Crunden Exhibit A1 (transcript pages 10,909-10,920).
Crunden Exhibit A2 (transcript page 10,921).
Crunden Exhibit A3 (transcript page 10,922).
Dorsey Exhibit 1 (transcript page 10,923).
Dorsey Exhibit 2 (transcript page 10,924).
Dorsey Exhibit 3 (transcript page 10,925).
Dorsey Exhibit 4 (transcript page 10,926).
Dorsey Exhibit 5 (transcript page 10,927).
Dorsey Exhibit 6 (transcript page 10,928).
Dorsey Exhibit 7 (transcript page 10,929).
Dorsey Exhibit 8 (transcript page 10,930).
[fol. 15701] Eide Exhibit 1 (transcript pages 10,931-10,981).
Eide Supplemental Exhibit 1 (transcript pages 10,982-10,983).
Eide Exhibit 2 (transcript page 10,984).
Eide Exhibit 3 (transcript pages 10,985-10,992).
Eide Exhibit 4 (transcript pages 10,933-10,999).
Gregory Exhibit 1 (transcript page 11,000).
Gregory Exhibit 2 (transcript pages 11,001-11,002).

Gregory Exhibit 3 (transcript page 11,003).
Gregory Exhibit 4 (transcript page 11,004).
Gregory Exhibit 5 (transcript page 11,005).
Gregory Exhibit 6 (transcript page 11,006).
Gregory Exhibit 7 (transcript page 11,007).
Hagenah Exhibit 1 (transcript pages 11,008-11,105).
Hagenah Exhibit 2 (transcript pages 11,106-11,246).
Hagenah Exhibit 3 (transcript page 11,247).
Hagenah Exhibit 4 (transcript page 11,248).
Hagenah Exhibit 5 (transcript page 11,249).
Hagenah Exhibit 7 (transcript pages 11,250-11,301).
Heiss Exhibit 9 (transcript pages 11,302-11,315).
[fol. 15702] Heiss Exhibit 10 (transcript pages 11,316-11,317).
Heiss Exhibit 11 (transcript page 11,318).
Heiss Exhibit 12 (transcript page 11,319).
Heiss Exhibit 13 (transcript page 11,320).
Heiss Exhibit 14 (transcript page 11,321).
Heiss Exhibit 15 (transcript page 11,322).
Heiss Exhibit 16 (transcript page 11,323).
Heiss Exhibit 17 (transcript page 11,324).
Heiss Exhibit 18 (transcript page 11,325).
Heiss Exhibit 19 (transcript page 11,326).
Heiss Exhibit 20 (transcript page 11,327).
Heiss Exhibit 21 (transcript page 11,328).
Heiss Exhibit 22 (transcript page 11,329).
Heiss Exhibit 23 (transcript page 11,330).
Heiss Exhibit 24 (transcript page 11,331).
Heiss Exhibit 25 (transcript page 11,332).
Heiss Exhibit 26 (transcript page 11,333).
Heiss Exhibit 27 (transcript page 11,334).
Hogan Exhibit 3 (transcript pages 11,335-11,346).
Hogan Exhibit 5 (transcript pages 11,347-11,370).
[fol. 15703] Hogan Exhibit 9 (transcript pages 11,371-11,420).
Hogan Exhibit 10 (transcript pages 11,421-11,422).
Kositzky Exhibit A1 (transcript pages 11,423-11,461).
Kositzky Exhibit A20 (transcript page 11,462).
Kositzky Exhibit A21 (transcript page 11,463).
Kositzky Exhibit A31 (transcript page 11,464).
Kositzky Exhibit A32 (transcript page 11,465).
Kositzky Exhibia A33 (transcropt page 11,466).
Kositzky Exhibit A34 (transcript page 11,467).

Kositzky Exhibit A35 (transcript page 11,468).
Morse Exhibit 1 (transcript pages 11,493-11,495).
Morse Exhibit 5 (transcript page 11,496).
Morse Exhibit 12 (transcript page 11,497).
Morse Exhibit 13 (transcript page 11,498).
Morse Exhibit 14 (transcript page 11,499).
Morse Exhibit 15 (transcript page 11,500).
Myers Exhibit 1 (transcript pages 11,501-11,511).
Myers Exhibit 3 (transcript pages 11,512-11,515).
[fol. 15704] Rhodes Exhibit A4 (transcript pages 11,529-11,541).
Rhodes Exhibit A5 (transcript pages 11,542-11,547).
Rhodes Exhibit A6 (transcript pages 11,548-11,550).
Schneider Exhibit 1 (transcript pages 11,551-11,694).
Schneider Exhibit 2 (transcript pages 11,695-11,702).
Schneider Exhibit 3 (transcript pages 11,703-11,852).
Schneider Exhibit 4 (transcript page 11,853).
Schneider Exhibit 5 (transcript page 11,854).
Schneider Exhibit 6 (transcript page 11,855).
Schneider Exhibit 7 (transcript page 11,856).
Schneider Exhibit 8 (transcript page 11,857).
Schneider Exhibit 9 (transcript page 11,858).
Schneider Exhibit 10 (transcript page 11,859).
Schneider Exhibit 11 (transcript page 11,860).
Schneider Exhibit 12 (transcript page 11,861).
Schneider Exhibit 13 (transcript page 11,862).
Schneider Exhibit 20 (transcript page 11,863).
Schneider Exhibit 21 (transcript page 11,864).
Stephens Exhibit 1 (transcript page 11,865).
Stephens Exhibit 2 (transcript page 11,866).
[fol. 15705] Stephens Exhibit 4 (transcript pages 11,867-11,875).
Stephens Exhibit 5 (transcript page 11,876).
Sloan Exhibit A1 (transcript pages 11,877-12,017).
Spring Exhibit 1 (transcript pages 12,018-12,019).
Uprichard Exhibit 1 (transcript pages 12,020-12,023).
Uprichard Exhibit 1A (transcript page 12,024).
Uprichard Exhibit 2 (transcript page 12,025).
Uprichard Exhibit 3 (transcript page 12,026).
Uprichard Exhibit 4 (transcript page 12,027).
Uprichard Exhibit 5 (transcript page 12,028).
Uprichard Exhibit 6 (transcript page 12,029).
Uprichard Exhibit 6A (transcript pages 12,030-12,031).
Uprichard Exhibit 6B (transcript page 12,032).

Uprichard Exhibit 6C (transcript page 12,033).
Uprichard Exhibit 6D (transcript pages 12,034-12,036).
Uprichard Exhibit 6E (transcript page 12,037).
Uprichard Exhibit 6F (transcript pages 12,038-12,040).
Uprichard Exhibit 6G (transcript page 12,041).
Uprichard Exhibit 13 (transcript page 12,042).
[fol. 15706] Uprichard Exhibit 14 (transcript page 12,043).
Uprichard Exhibit 15 (transcript page 12,044).
Uprichard Exhibit 16 (transcript page 12,045).
Williams Exhibit 1 (transcript page 12,046).
Williams Exhibit 2 (transcript page 12,047).
Williams Exhibit 3A (transcript pages 12,048-12,049).
Williams Exhibit 3B (transcript pages 12,050-12,058).
Williams Exhibit 7A (transcript pages 12,059-12,417).
Williams Exhibit 7B (transcript pages 12,418-12,673).
Williams Exhibit 7C (transcript pages 12,674-12,803).
Williams Exhibit 8 (transcript page 12,804).
Williams Exhibit 9 (transcript page 12,805).
Williams Exhibit 10 (transcript page 12,806).
Williams Exhibit 11 (transcript page 12,807).
Williams Exhibit 12 (transcript page 12,808).
Williams Exhibit 14 (transcript pages 12,809-12,814).
Williams Exhibit 16 (transcript page 12,815).
Wilson Exhibit 1 (transcript page 12,816).
[fol. 15707] Wilson Exhibit 2 (transcript page- 12,817-12,818).
Wood Exhibit 1 (transcript pages 12,819-12,822).
Wood Exhibit 2 (transcript page 12,823).
Wood Exhibit 3 (transcript page 12,824).
Wood Exhibit 4 (transcript page 12,825).
Wood Exhibit 5 (transcript page 12,826).
Wood Exhibit 6 (transcript page 12,827).
Wood Exhibit 7 (transcript page 12,828).
Wood Exhibit 8 (transcript page 12,829).
Wood Exhibit 9 (transcript page 12,830).
Wood Exhibit 9A (transcript page 12,831).
Wood Exhibit 9B (transcript page 12,832).
Wood Exhibit 10 (transcript page 12,833).
Wood Exhibit 11 (transcript page 12,834).
Wood Exhibit 12 (transcript page 12,835).
Wood Exhibit 13 (transcript pages 12,836-12838).
Wood Exhibit 14 (transcript page 12,839).

Wood Exhibit 15 (transcript page 12,840).
Wood Exhibit 16 (transcript page 12,841).
[fol. 15708] Wood Exhibit 17 (transcript page 12,842).
Wood Exhibit 18 (transcript page 12,843).
Wood Exhibit 19 (transcript page 12,844).
Wood Exhibit 20 (transcript page 12,845).
Wood Exhibit 21 (transcript pages 12,846-12,850).
Wood Exhibit 22 (transcript page 12,851).

Report to the Commission by E. W. Wood of August 11, 1934 (transcript pages 12,852-12,858).

(40) The following from the record of said cause No. 3307:

(a) Exhibits prepared by Richard H. Gregory in accordance with requests made at hearings of June 17 and 18, 1931 numbered 1 to 12 inclusive, 14 and 15, and 17 to 19 inclusive, and including of No. 1 both the original and the revised Exhibit; as certified (transcript pages 12,859-12,889).

(b) Exhibits prepared by Charles A. Heiss in accordance with request made at hearing of June 19, 1931 and numbered 1 to 4 (transcript pages 12,890-12,928) and 6 to 12 (transcript pages 13,017-13,033), in each instance inclusive (as certified, except that No. 5 (transcript pages 12,929-13,016) is to be omitted from the printing).

(c) Commission's order of April 22, 1932 with reference to the several requests of special counsel for the Commission (transcript pages 13,034-13,045).

[fol. 15709] (d) Response of Appellant of May 7, 1932 to Commission's order of April 22, 1932 (transcript pages 13,046-13,048).

(e) Appellant's additional responses numbered 5, 7, 10, 13a and 13b to said several requests (transcript pages 13,049-13,055).

(f) Exhibits showing gross additions to plant 1923 to 1931 and other data filed with the Commission November 2, 1932 in response to requests 1 to 5 of special counsel for the Commission of October 22, 1932 (transcript page 13,056).

(g) Responses to the Commission's request of August 24, 1933 including:

(1) Comparative Balance Sheet June 30, 1925 and June 30, 1932 (transcript page 13,331);

(2) Recapitulation of assets and liabilities June 30, 1925 and June 30, 1932 (transcript pages 13,332-13,333);

(3) Net additions June 30, 1925 to June 30, 1932 (including references to Commission's orders authorizing reimbursement of the treasury) (transcript page 13,334);

(4) Statement of mortgage notes assumed on property purchased (transcript page 13,335).

(h) Letter of September 15, 1933 from the Commission to Karl E. Burr, General Counsel for The Ohio Bell Telephone Company, requesting certain data; Mr. Burr's response of September 20, 1933 and the four accompanying statements as set forth in said letter (transcript pages 13,336-13,356).

(i) The letter of June 14, 1933 from the Commission to Karl E. Burr requesting 12 statements; Mr. Burr's response of June 21, 1933 and the 12 statements enclosed; and Mr. Burr's letter to the Commission of July 26, 1933 (transcript pages 13,357-13,382).

[fol. 15710] (j) A tabulation of 60 pages submitted to the Commission by appellant, as follows:

(1) Rates for exchange service transcript pages 13,383-13,430);

(2) Revisions in toll rates effective October 1, 1926 (transcript pages 13,431-13,437);

(3) Tariff schedules in effect January 1, 1934 not under bond (transcript pages 13,438-13,441);

(4) Tariff schedules in effect January 1, 1934 under bond (transcript pages 13,442-13,444);

(k) Appellant's monthly reports 2 to 6 inclusive as of November 30, 1933 (transcript pages 13,445-13,451).

(l) Revenue, expense and rate data filed April 17, 1934 in response to the Commission's order of March 1, 1934, together with the transmittal letter of The Ohio Bell Telephone Company addressed to the Commission of April 17, 1934 and the further letter of the Company to the Commission of the same date (transcript pages 13,452-13,761).

(m) Letter of August 12, 1933 from the Ohio Bell Telephone Company to The Public Utilities Commission of Ohio relative to the separate cases and the Commission's letter of acknowledgment of August 21, 1933 addressed to Karl

E. Burr, General Counsel of The Ohio Bell Telephone Company (transcript pages 13,762-13,763).

(n) Letter of December 22, 1933 from The Ohio Bell Telephone Company to The Public Utilities Commission and the Commission's acknowledgment of December 28, 1933 addressed to Karl E. Burr (transcript pages 13,764-13,765).

[fol. 15711] (o) Letter of The Public Utilities Commission to Karl E. Burr of March 23, 1933 and Mr. Burr's reply to Commissioner Geiger of April 3, 1933 transcript pages 13,766-13,767).

(41) Include also in said printing the following exhibits or extracts therefrom originally introduced in the case of Illinois Bell Telephone Company v. Gilbert, and by stipulation made part of the record in said Cause No. 3307, to-wit:

Exhibit A-66 (transcript pages 13,768-13,770).
" A-67 (transcript pages 13,771-13,773A).
" A-75 (transcript page 13,774).
" A-76 (transcript page 13,775).
" A-77 (transcript page 13,776).
" A-78 (transcript page 13,777).
" A-79 (transcript page 13,778).
" A-80 (transcript page 13,779).
" A-81 (transcript page 13,780).
" A-82 (transcript page 13,781).
" A-83 (transcript page 13,782).
" A-84 (transcript page 13,782).
" A-85 (transcript pages 13,783-13,784).
" A-86 (transcript pages 13,784-13,785).
" A-87 (transcript pages 13,785-13,786).
" A-88-B (transcript pages 13,787-13,788).
" A-90-B (transcript page 13,789).
" A-91 (transcript page 13,790).
" A-92 (transcript page 13,790).
" A-93B (transcript page 13,791).

[fol. 15712]

Exhibit A-94-B (transcript page 13,792).
" A-95-B (transcript page 13,793).
" A-96-B (transcript page 13,794).
" A-99 (transcript page 13,795).
" A-100 (transcript pages 13,796-13,799).
" A-101-B (transcript pages 13,800-13,802).

Exhibit A-103 (transcript page 13,803).
" A-108-B (transcript page 13,804).
" A-109 (transcript page 13,805).
" A-110 (transcript page 13,806).
" A-111 (transcript pages 13,806-13,807).
" A-112-B (transcript page 13,808).
" A-113-B (transcript page 13,809).
" A-115 (transcript page 13,831).
" A-116 (transcript pages 13,832-13,833).
" A-117-B (transcript page 13,834).
" A-118-B (transcript pages 13,835-13,850).
" A-119-B (transcript page 13,851).
" A-120 (transcript page 13,852).
" A-121-B (transcript page 13,853).
" A-123 (transcript page 13,855).
" A-124-B (transcript page 13,856).
" A-150-B (transcript page 13,860).
" A-151-B (transcript page 13,861).
" A-152-B (transcript page 13,862).
" A-153-B (transcript page 13,863).

[fol. 15713]

Exhibit A-154-B (transcript page 13,864).
" A-155-B (transcript pages 13,865-13,867).
" A-156-B (transcript page 13,868).
" A-157-B (transcript page 13,869).
" A-158-B (transcript page 13,870).
" A-159-B (transcript page 13,871).
" A-160-B (transcript page 13,872).
" A-161-B (transcript pages 13,873-13,875).
" A-162-B (transcript pages 13,876-13,877).
" A-163-B (transcript page 13,878).
" A-164 (transcript pages 13,879-13,882).
" A-165 (transcript page 13,882).
" A-166-B (transcript page 13,883).
" A-167-B (transcript pages 13,884-13,885).
" A-168-B (transcript page 13,886).
" A-169-B (transcript pages 13,887-13,888).
" A-170-B (transcript pages 13,889-13,893).
" A-171 (transcript page 13,894).
" A-172 (transcript page 13,895).
" A-174-B (transcript page 13,896).
" A-194 (transcript page 13,900).
" A-198 (transcript page 13,904).

Exhibit A-199 (transcript page 13,905).
" A-200-B (transcript page 13,906).
" A-201-B (transcript page 13,907).
" A-202 (transcript page 13,908).
" A-227 (transcript page 13,941).

[fol. 15714]

Exhibit A-228 (transcript page 13,942).
" A-229 (transcript pages 13,943-13,945).
" A-230 (transcript pages 13,946-13,947).
" A-231 (transcript pages 13,948-13,950).
" A-233 (transcript pages 13,951-13,955).
" A-256 (transcript page 13,959).
" A-257 (transcript pages 13,960-13,963).
" A-260 (transcript page 13,966).
" A-261 (transcript pages 13,966-13,968).
" A-271 (transcript page 13,982).
" D-19 (transcript page 13,983).
" D-27 (transcript page 13,985).
" D-28 (transcript pages 13,986-13,987).
" D-29 (transcript pages 13,988-14,002).
" D-30 (transcript page 14,003).
" D-31 (transcript page 14,004).
" D-32 (transcript pages 14,005-14,006).
" D-33 (transcript page 14,007).
" D-34 (transcript page 14,008).
" D-35 (transcript page 14,009).
" D-36 (transcript pages 14,009-14,010).
" D-38 (transcript pages 14,010-14,011).
" D-39 (transcript pages 14,011-13,012).
" D-41 (transcript page 14,012).
" D-42 (transcript page 14,013).
" D-46 (transcript page 14,014).
" D-48 (transcript page 14,016).
" D-49 (transcript page 14,017).

[fol. 15715]

Exhibit D-50 (transcript pages 14,017-14,018).
" D-51 (transcript pages 14,018-14,019).
" D-52 (transcript pages 14,020-14,022).
" D-53 (transcript page 14,923).
" D-54 (transcript pages 14,023-14,024).
" D-55 (transcript pages 14,024-14,025).
" D-56 (transcript page 14,026).
" D-61 (transcript page 14,027).

Exhibit D-62 (transcript page 14,028).
" D-63 (transcript page 14,029).
" D-69 (transcript page 14,034).
" D-72 (transcript pages 14,047-14,053).
" D-73 (transcript page 14,054).
" R-74 (transcript pages 14,055-14,061).
" D-77 (transcript pages 14,072-14,075).
" D-78 (transcript pages 14,076-14,077).
" D-79 (transcript page 14,078).
" D-81 (transcript page 14,079).
" D-82 (transcript pages 14,079-14,080).
" R-83 (transcript page 14,080).
" D-84 (transcript page 14,081).
" D-86 (transcript page 14,082).
" D-87 (transcript page 14,082).
" D-88 (transcript page 14,083).
" D-89 (transcript page 14,083).
" D-90 printing the first four pages only (transcript pages 14,084-14087).
" D-93 (transcript page 14,111).
" D-94 (transcript page 14,111).
" D-95 (transcript page 14,112).

[fol. 15716]

Exhibit D-96 (transcript page 14,112).
" D-97 (transcript page 14,112).
" D-99 (transcript page 14,113).
" D-100 (transcript pages 14,114).
" D-101 (transcript pages 14,115-14,121).
" D-102 (transcript pages 14,122-14,124).
" D-103 (transcript page 14,125).
" D-104 (transcript page 14,126).
" D-111 (transcript page 14,127).
" D-112 (transcript pages 14,128-14,132).
" D-116 (transcript pages 14,133-14,136).
" D-122 (transcript page 14,137).
" D-1-35 (transcript pages 14,138-14,140).
" D-136 (transcript page 14,141).
" D-137 (transcript pages 14,142-14,143).
" X-13-A (transcript page 14,144).
" X-14 (transcript pages 14,145-14,147).
" X-15 (transcript page 14,148).
" X-16 (transcript page 14,149).
" X-34 (transcript pages 14,150-14,151).

Exhibit X-35 (transcript pages 14,152-14,153).
" X-39 (transcript page 14,164).
" X-40 (transcript page 14,165).

[fol. 15717]

Exhibit X-41 (transcript page 14,166).
" X-42 (transcript page 14,167).
" X-43 (transcript page 14,168).
" X-44 (transcript page 14,169).
" X-45 (transcript page 14,170).
" X-46 (transcript page 14,171).
" X-47 (transcript page 14,172).
" X-48 (transcript page 14,176).
" X-49 (transcript pages 14,177-14,179).
" X49½ (transcript pages 14,180-14,182).
" X-49-A (transcript page 14,183).
" X-50 (transcript pages 14,184-14,186).
" X-50-A (transcript pages 14,187-14,188).
" X-55 (transcript pages 14,189-14,190).
" X-67 (transcript page 14,191).
" X-69 (transcript page 14,191).
" X-70 (transcript page 14,192).
" X-71 (transcript page 14,192).
" X-72 (transcript page 14,193).
" X-73 (transcript page 14,193).
" X-74-A (transcript pages 14,194-14,202).
" X-75 (transcript page 14,202).
" X-79 (transcript pages 14,220-14,221).
" X-80 (transcript page 14,222).
" X-81 (transcript page 14,223).
" X-82 (transcript page 14,223).
" X-83 (transcript page 14,224).
" X-83-A (transcript page 14,225).

[fol. 15718]

Exhibit X-88 (transcript page 14,226).
" X-89 (transcript pages 14,227-14,228).
" X-90 (transcript page 14,229).
" X-91 (transcript page 14,230).
" X-92 (transcript pages 14,231-14,248).
" X-93 (transcript pages 14,249-14,251).
" X-94 (transcript pages 14,252-14,265).
" X-95 (transcript pages 14,265-14,266).
" X-96 (transcript page 14,267).
" X-97 (transcript page 14,268).

Exhibit X-99 (transcript page 14,269).
" X-100, printing only the first page (transcript page 14,270).
" X-109 (transcript page 14,297).
" X-110 (transcript pages 14,297-14,298).
" X-111 (transcript page 14,299).
" X-112 (transcript page 14,300).
" X-121 (transcript page 14,301).
" X-148 (transcript page 14,302).
" X-192 (transcript page 14,303).
" X-193 (transcript pages 14,304-14,307).
" X-207, printing only transcript pages 14,327 and 14,340, inclusive.
" X-208, printing only transcript pages 14,346 and 14,352, inclusive.
" X-211 (transcript pages 14,353-14,355).
" X-217 (transcript pages 14,355-14,359).
" X-225 (transcript page 14,380).
" X-227 (transcript page 14,381).
" X-228 (transcript page 14,382).

[fol. 15719]

Exhibit X-229 (transcript page 14,383).
" X-231 (transcript page 14,384).
" X-232 (transcript pages 14,385-14,385A).
" X-233 (transcript page 14,386).
" X-234 (transcript page 14,387).
" X-235 (transcript pages 14,388-14,390).
" X-236 (transcript page 14,391).
" X-237 (transcript pages 14,392-14,395).
" X-238 (transcript page 14,396).
" X-239 (transcript pages 14,397-14,400).
" X-240 (transcript page 14,401).
" X-241 (transcript pages 14,402-14,406).
" X-242 (transcript page 14,407).
" X-243 (transcript pages 14,408-14,412).
" X-244 (transcript page 14,413).
" X-245 (transcript page 14,414).
" X-246 (transcript page 14,415).
" X-247 (transcript pages 14,416-14,417).
" X-248 (transcript page 14,418).
" X-249 (transcript pages 14,419-14,420).
" X-250 (transcript page 14,421).
" X-251 (transcript pages 14,422-14,424).

Exhibit X-258 (transcript page 14,436).
" X-259 (transcript pages 14,436-14,437).
" X-260 (transcript page 14,438).
" X-261, printing only transcript pages 14,439-14,441 inclusive.
" X-262, printing only transcript pages 14,543 and 14,544.
" X-294 (transcript page 14,567).
" X-295 (transcript pages 14,568-14,572).

[fol. 15720]

Exhibit X-316 (transcript page 14,588).
" X-321 (transcript page 14,601-14,602).
" X-343 (transcript page 14,611).
" X-365 (transcript pages 14,726-14,732).
" X-367 (transcript pages 14,732-14,735).
" X-370 (transcript pages 14,739-14,741).
" X-371 (transcript page 14,742).
" X-374 (transcript pages 14,762-14,764).
" X-375 (transcript pages 14,764-14,766).
" X-378 (transcript pages 14,766-14,777).
" X-379 (transcript pages 14,777-14,781).
" X-380 (transcript pages 14,781-14,786).
" X-381 (transcript pages 14,786-14,791).
" X-382 (transcript pages 14,791-14,792).
" X-383 (transcript pages 14,792-14,803).
" X-385 (transcript pages 14,803-14,810).
" X-386 (transcript pages 14,810-14,816).
" X-388 (transcript pages 14,817-14,821).
" X-393 (transcript pages 14,843-14,851).
" X-394 (transcript pages 14,851-14,852).
" X-397 (transcript pages 14,853-14,854).
" X-398 (transcript pages 14,854-14,865).
" X-433 (transcript pages 14,921-14,922).
" X-434 (transcript pages 14,922-14,924).

[fol. 15721] Include also in said printing the following deposition exhibits from said Chicago case:

4 (transcript pages 14,945-14,951).
5 (transcript page 14,952).
6 (transcript page 14,953).
7 (transcript pages 14,954-14,966).
8 (transcript pages 14,967-14,969).
26 (transcript pages 14,999-15,000).

50 (transcript pages, 15,094-15,102).
77 (transcript pages 15,123-15,124).
119 (transcript pages 15,146-15,147).
134 (transcript page 15,161).
139 (transcript pages 15,161-15,163).
142 (transcript pages 15,164-15,164 A).
146 (transcript pages 15,165-15,166).
149 (transcript pages 15,166-15,167).
152 (transcript page 15,167).
155 (transcript page 15,168).
158 (transcript page 15,169).
161 (transcript page 15,170).
164 (transcript page 15,171).
169 (transcript page 15,172).
170 (transcript page 15,173).
173 (transcript page 15,174).
176 (transcript page 15,175).
179 (transcript page 15,176).
189 (transcript pages 15,179-15,180).
[fol. 15722] 190 (transcript page 15,180).
190 (transcript page 15,180).
193 (transcript pages 15,274-15,275).
195 (transcript page 15,276).
196 (transcript pages 15,276-15,278).
197 (transcript page 15,279).
205 (transcript pages 15,284-15,291).

(42) Include also in said printing the following exhibits from the so-called toll case, otherwise known as Advanced Utility Rate Proceeding, No. 124:

Cox Exhibit 10 (transcript pages 15,292-15,296).
Cox Exhibit 11 (transcript page 15,297).
Cox Exhibit 12 (transcript page 15,298).
Cox Exhibit 13 (transcript pages 15,299-15,303).
Cox Exhibit 14 (transcript pages 15,304-15,308).
Cox Exhibit 15 (transcript pages 15,309-15,313).
Crunden Exhibit 2 (transcript page 15,314).
Crunden Exhibit 11 (transcript pages 15,315-15,322).
Crunden Exhibit 12 (transcript page 15,323).
Kositzky Exhibit 2 (transcript pages 15,324-15,467).
Kositzky Exhibit 13 (transcript pages 15,468-15,537).
Kositzky Exhibit 26 (transcript page 15,538).
Kositzky Exhibit 28 (transcript page 15,539).

Kositzky Exhibit 30 (transcript page 15,540).
Kositzky Exhibit 31 (transcript page 15,541).
[fol. 15723] Kositzky Exhibit 32 (transcript page 15,542)
Kositzky Exhibit 33 (transcript page 15,543).
Rhodes Exhibit 3 (transcript page 15,544).
Rhodes Exhibit 83 (transcript page 15,545).
Rhodes Exhibit 84 (transcript pages 15,546-15,590).
Rhodes Exhibit 87 (transcript pages 15,591-15,609).
Rhodes Exhibit 88 (transcript pages 15,610-15,621).

(43) Include also in said printing the following exhibi from the so-called "Service Connection Charge C se," being cause No. 1728 on the docket of said Commiss on a consolidated into said company-wide case No. 3307:

Cooper Exhibit 6 (transcript page 15,671).
Cooper Exhibit 9 (transcript page 15,672).
Cooper Exhibit 10 (transcript page 15,673).
Cooper Exhibit 11 (transcript page 15,674).
Cooper Exhibit 12 (transcript page 15,675).
Cooper Exhibit 13 (transcript page 15,676).

Karl E. Burr, W. H. Thompson, W. B. Stewa Ashley M. Van Duzer, Thomas V. Koykka, A torneys for Appellant.

Service of the foregoing and receipt of a copy thereof Columbus, Ohio, this 18th day of November, 1936 are here acknowledged.

John W. Bricker, Attorney General of Ohio; Don C. Power, Attorneys for Appellee. The Pub Utilities Commission of Ohio, by E. J. Hopp Chairman.

[fol. 15724] [File endorsement omitted.]

Endorsed on cover: File No. 41,079. Ohio Supre Court. Term No. 539. The Ohio Bell Telephone Compa appellant, vs. The Public Utilities Commission of Oh Filed November 20, 1936. Term No. 539, O. T., 1936.

FILED
NOV 20 1936
CHARLES ELMORE CROPLEY
CLERK

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1936

No. 539

THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

THE PUBLIC UTILITIES COMMISSION OF OHIO.

APPEAL FROM THE SUPREME COURT OF THE STATE OF OHIO.

STATEMENT AS TO JURISDICTION.

KARL E. BURR,
W. H. THOMPSON,
W. B. STEWART,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Counsel for Appellant.

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1936

No. 539

THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

THE PUBLIC UTILITIES COMMISSION OF OHIO,
Appellee.

APPEAL FROM THE SUPREME COURT OF OHIO.

JURISDICTIONAL STATEMENT.

This is an appeal from the final judgment of the Supreme Court of Ohio in Consolidated Cause No. 25065 on the docket of said court, entitled:

> "The Ohio Bell Telephone Company, Plaintiff in Error, *vs.* The Public Utilities Commission of Ohio, Defendant in Error."

Said cause was a proceeding to review directly in that court (pursuant to Section 544, *et seq.* of the General Code of Ohio) orders of The Public Utilities Commission of Ohio dated January 16, March 1, July 5 and 9, and September

6, 1934. These several orders were entered by the Commission in a company-wide case instituted by the Commission and involving the determination of (a) the fair value of appellant's intrastate telephone property in Ohio for 1925 and subsequent years, (b) the reasonableness of its rates, and (c) whether, in separate rate cases pending before the Commission and consolidated by it with the said company-wide case, appellant should be required to refund portions of certain increased rates put into effect by appellant in certain exchanges and in the toll system under separate bonds in each such case, in accordance with the Robinson and Pence laws (108 Ohio Laws 1094, 110 Ohio Laws 366).

Appellant prosecuted separate error proceedings in the Supreme Court of Ohio to review the several orders of the Commission, such proceedings being numbered 24694, 24695, 25023 and 25065 on the docket of that court. These cases were consolidated by the court into the instant case, No. 25065, heard on a single record, briefed and argued as one cause and decided by a single opinion and judgment.

The opinion is reported in 131 Ohio State Reports 539, and a copy attached hereto as Appendix "A."

By said judgment the Supreme Court of Ohio affirmed, as against appellant's claim of denial of due process and equal protection of the laws under the Fourteenth Amendment to the Constitution of the United States, the orders of the Commission, determining for each of the years 1925 to 1933, inclusive, (a) the value of appellant's intrastate property, (b) its net income from its intrastate business, and (c) the extent to which such net income was excessive; (d) refusing to approve for the year 1934 and thereafter appellant's then effective rates, notwithstanding the Commission found that for the year 1933, the last year under inquiry, said rates produced no more than the sum found

by the Commission to be fair and reasonable; and (e) ordering refunds for 1925 to 1932, inclusive, of $11,832,264 with interest, produced by rates collected under bond.

(a) Date of Judgment.

The date of the judgment sought to be reviewed was July 22, 1936; application for rehearing, duly filed on August 3, 1936, was overruled on October 7, 1936, and thereupon, to-wit, on October 7, 1936, said judgment became final.

(b) Date of Application for Appeal to the Supreme Court of the United States.

Petition for appeal to this Court was presented to the Chief Justice of the Supreme Court of Ohio on October 14, 1936.

(c) Statutory Provisions Giving Jurisdiction.

This Court has jurisdiction of this cause under Judicial Code Section 237 as amended (28 U. S. C. A. 344) which provides:

> "(a) A final judgment or decree in any suit in the highest court of a State in which a decision in the suit could be had, where is drawn in question the validity of a treaty or statute of the United States, and the decision is against its validity; or where is drawn in question the validity of a statute of any State, on the ground of its being repugnant to the Constitution, treaties, or laws of the United States, and the decision is in favor of its validity, may be reviewed by the Supreme Court upon a writ of error. The writ shall have the same effect as if the judgment or decree had been rendered or passed in a court of the United States. The Supreme Court may reverse, modify, or affirm the judgment or decree of such State court, and

may, in its discretion, award execution or remand the cause to the court from which it was removed by the writ,"

and 45 Stat. 54, January 31, 1928, c. 14, Sec. 1, 28 U. S. C. A. 861a and 45 Stat. 466, April 26, 1928, c. 440, 28 U. S. C. A. 861b, substituting appeal for the writ of error.

(d) **Statute, Validity of Which is Involved.**

The statute of Ohio, the validity of which is involved, consists of the orders* of the Public Utilities Commission of Ohio of January 16, March 1, July 5 and 9, and September 6, 1934.

None of the orders is published, but the Commission's opinion and finding of January 16, 1934, appears in 2 P. U. R. (N. S.) 113, and is attached hereto, marked Appendix "B."

(e) **Pertinent Provisions of the Commission's Orders.**

(1) The Commission valued appellant's property used in intrastate service in Ohio as of June 30, 1925, "the date certain," by separate classes of plant at the total sum of $93,707,488; and for each of the years 1926 to 1933, inclusive, by the application of a price trend percentage to the total value found for the property for the preceding year, plus net additions, at the following sums:

1926	$101,767,774
1927	111,036,522
1928	122,417,735
1929	134,765,576

* Being legislative in character they are "statutes" within the meaning of Section 237 of the Judicial Code. *Sultan Ry. Co.* v. *Department of Labor*, 277 U. S. 135; *Hamilton* v. *Regents*, 293 U. S. 245.

1930	145,683,047
1931	145,271,663
1932	133,625,655
1933	126,250,206

(2) The values so fixed did not for any of said years include any allowance for construction work in progress averaging $3,000,000 annually, or for going value, nor did the value for 1925 include any allowance for parcels of useful real estate of the value of more than $500,000.

(3) The Commission found the existing depreciation of the property as of June 30, 1925, to be $14,226,709, which was 13.18% of the reproduction cost new of the depreciable property as fixed by the Commission.

(4) The Commission found the amount of appellant's intrastate revenues (not disputed) and the amount of its allowable expenses. In arriving at appellant's allowable expenses the Commission disallowed large portions of appellant's annual expense of depreciation which was based upon the service life and salvage of appellant's property. Instead the Commission purported to base the annual expense of depreciation upon appellant's retirement experience, but for the years 1925 to 1933, inclusive, allowed $8,067,266 less than appellant's net loss on account of plant retired. It also disallowed $2,800,000 of the payments made by appellant for the years 1925 to 1932, inclusive, to the American Telephone and Telegraph Company on account of license contract services. From the foregoing the Commission determined appellant's net income from its intrastate business for each year and computed therefrom the resulting rate of return upon the value found by the Commission.

(5) The Commission fixed as the reasonable rates of return: 7% for the years 1925 to 1929, inclusive, 6½% for

1930 and 1931 and 5½% for 1932 and 1933, and determined that appellant had realized net earnings in excess of a fair and reasonable return in each of said years, except the final year 1933, said excess amounting in the aggregate to more than $13,000,000.

(6) By the use of an accounting apportionment, the Commission determined that $11,832,264 of such excess earnings were subject to refund, determined the amount of refund for each bonded exchange for 1925 to 1932, inclusive, and for the toll system for 1925 and 1926, and ordered appellant to make refunds accordingly with interest.

(7) The Commission found that appellant was earning no more than a fair rate of return for the year 1933 at its then effective rates. It refused appellant's requests to approve such rates for the future, or, in the alternative, to afford appellant a hearing as to the reasonableness of its rates for the year 1934.

(f) Presentation of Federal Questions to Commission and Court.

Appellant sought the correction of each of the findings and orders of the Commission, first, by appropriate and timely requests, protests and applications to the Commission for a rehearing, asserting therein specifically that each of said findings and orders was erroneous, arbitrary and confiscatory in effect and deprived appellant of its property without due process of law, and denied to appellant the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States; and second, by its said petitions in error to the Supreme Court of Ohio, upon the same grounds, including

specifically the constitutional grounds stated; all as more particularly hereinafter shown.

I. Price Trends: Undisclosed Information.

In the Commission's order of January 16, 1934, it appeared for the first time that the Commission had fixed the value of appellant's intrastate property for each of the years 1926 to 1933, inclusive, by means of a price trend percentage applied to the total value found for the property for the preceding year, plus net additions. Such percentages were based upon information undisclosed to appellant, not offered in evidence, and as to which appellant was denied opportunity to examine or rebut.

On February 6, 1934, in appellant's protest and application for rehearing with respect to said order, it challenged the Commission's right to use such undisclosed price trend information and, after setting out the facts, made the following averment:

> "The alleged facts so considered did not come from any official sources which the Commission had the right to notice judicially. They were not published by any public authority, governmental or State. They were not introduced in evidence, and the respondent had no opportunity to examine or to cross-examine as to such claimed proof or to explain or rebut the same, or to show that such claimed price trends could not fairly be considered in determining the fair value of respondent's property. By reason of these facts the Commission denied the respondent a fair hearing and in determining this case admittedly considered and gave controlling weight to evidence not introduced in any hearing. The order of the Commission based upon such claimed proof deprives the respondent of its property without due process of law and denies to the respondent the equal protection of the laws in

violation of the Fourteenth Amendment to the Constitution of the United States."

(Exhibit F, p. 167*).

This and appellant's subsequent protests and applications for rehearing (Exhibit I, pp. 193-195; Exhibit P, pp. 265, 266-269; Exhibit T, p. 327, at pp. 331-333) were denied by the Commission.

(Exhibit H, pp. 187-188, Order of March 9, 1934; Exhibit R, same pp. 311-312, 316; Order of October 19, 1934.)

Each alleged in substantially the language last above quoted that the orders of the Commission with respect to values for the years 1926 and thereafter and the refunds based thereon constituted a denial to appellant of due process and of equal protection of the laws under the Fourteenth Amendment to the Constitution of the United States.

On February 17, July 31 and September 25, 1934, respectively, appellant filed with the Commission written requests for an opportunity to examine and rebut such undisclosed information.

(Exhibit G, pp. 185, 186; Exhibit L, p. 231, at pp. 235-6; Exhibit S, p. 321, at pp. 324-5.)

These requests were denied by the Commission.

(Exhibit H, pp. 187-188; Exhibit R, pp. 311, 312 and 316; Order of September 27, 1934.)

---

*This and other exhibits hereinafter referred to are appended to the petition in error in Cause No. 25065. The references are so made because the case was not heard by the Supreme Court of Ohio upon a printed record but upon the original transcript of the proceedings before the Commission.

In each petition in error this action of the Commission and its denial of appellant's requests in respect of the same were similarly challenged.

(Petition in Error No. 25065, Appendix A hereto, pp. 14-16, 34-35, 37; Petition in Error No. 24694, pp. 6-8, 34; Petition in Error No. 24695, pp. 7-9, 20; Petition in Error No. 25023, pp. 8-11, 50.)

The petition in error in Case No. 25065 contains the following averment:

"By reason of these facts the Commission denied plaintiff in error a fair hearing and in determining this case admittedly considered and gave controlling weight to evidence not introduced in any hearing.

"On February 17, July 31 and September 25, 1934, plaintiff in error filed the written requests heretofore referred to, each of which in specific terms asked the Commission to disclose the evidence on which it had arrived at the price trends above referred to and had fixed the value of plaintiff in error's intrastate property. These requests were all denied. • • •

"The findings of value and the orders of the Commission fixing the amount of the refunds, aggregating $11,832,264, which were necessarily based upon such claimed proof, deprive plaintiff in error of its property without due process of law and deny to plaintiff in error the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States; and said findings and orders are therefore void in their entirety."

(Petition in Error No. 25065, Appendix A hereto, pp. 15-16.)

II. Property Values, Expenses and Resulting Refunds

With respect to each of the Commission's orders on these subjects appellant duly filed with the Commission its protests and applications for rehearing (Exhibit C, p. 33, at

pp. 34-37; Exhibit F, p. 163, at pp. 164-171, 175-183; Exhibit I, p. 193, at pp. 201-221; Exhibit P, p. 265, at pp. 280-305, and Exhibit T, p. 327, at pp. 350-372, 379-380), each of which was overruled.

(Exhibit E, p. 153, 154; Exhibit H, p. 187; Exhibit R, p. 311, 312, 316; Order of March 9, 1934; Order of October 19, 1934.)

In each such protest and application appellant specifically challenged the validity of the several findings and orders of the Commission in the following, among other, respects: The undervaluation of appellant's property, including the elimination of useful real estate, the Commission's disallowance of stated undistributed construction costs, the elimination of going value, the elimination of property in proces of construction, and the overstatement of the depreciation existing in the property; the disallowance of the expense of depreciation; the disallowance of license contract payments; and the refunds ordered.

Specifically, in appellant's protest and application for rehearing filed October 1, 1934, directed to the Commission's order of September 6, 1934, appellant averred that in each and all of said respects the said findings and orders were

> "confiscatory and will, if enforced, result in the confiscation of respondent's property and will deprive it of its property without due process of law • • • in violation of the Fourteenth Amendment of the Constitution of the United States."

(Exhibit T, p. 327, at p. 380.)

In each of appellant's other protests and applications for rehearing the validity of the Commission's action was challenged in substantially the same manner.

(Exhibits C, F, I, P and T, pp. 37, 182, 220, 304 and 380.)

In the Supreme Court of Ohio appellant, in its petition in error No. 25065, challenged the validity of each of said findings, denials and orders in each of said respects as effecting denial to appellant of due process of law under the Fourteenth Amendment.

(Petition in Error 25065, included in Appendix A hereto, pp. 19-30, 37.)

In each of its other petitions in error appellant similarly challenged said successive orders in said respects as depriving appellant of due process of law under the Fourteenth Amendment.

(Petition in Error No. 24694, pp. 14-34; No. 24695, pp. 11-20; No. 25023, pp. 26-43, 45-50.)

III. Refunds Ordered Arbitrarily

The Commission's order of September 6, 1934 fixed the amount of refunds at $11,832,264. This amount was arrived at by a method of apportionment, after the Commission had refused to grant appellant's requests for hearings with respect to its property value and net income in the bond cases.

The method was employed in the orders of July 5 and September 6, 1934. In its protests and applications for rehearing directed to said orders appellant challenged the Commission's use of said apportionment method and the refunds resulting therefrom as depriving appellant of its property without due process of law and denying it the equal protection of the laws contrary to the Fourteenth Amendment to the Constitution of the United States.

In its protest and application for rehearing directed to the Commission's order of September 6, 1934, it is averred:

"(a) Instead of considering the fair value of respondent's property and net earnings separately by

exchanges and separately for its toll system, the Commission, in making said apportionments and allocation, unlawfully and arbitrarily used and applied wholly irrelevant accounting methods and made wholly irrelevant calculations, having no relation to any property values and net earnings. It was impossible lawfully to make said apportionments and allocation by any accounting methods and calculations or to order any refunds based thereupon.

"(b) The Commission's method employed in making said apportionments and allocation was wholly arbitrary and not based upon any evidence in the case."

The protest and application for rehearing further specifically averred that the use of such apportionment method deprived respondent of its property without due process of law and denied it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

(Exhibit T, p. 327, at pp. 342-346.)

The said action of the Commission was similarly challenged as depriving appellant of due process of law and denying it the equal protection of the laws in appellant's protest and application for rehearing directed to the order of the Commission of July 5, 1934.

(Exhibit P, p. 265, at pp. 276-277.)

Said protests and applications for rehearing were overruled.

(Exhibit R, pp. 311, 312, 316; Order of October 19, 1934.)

In its petition in error in the Supreme Court of Ohio directed to the Commission's order of September 6, 1934, (Petition in Error No. 25065, Appendix A hereto, pp. 17-19,

25, 34-37) appellant challenged the Commission's use of said apportionment method and the refunds resulting therefrom. It was there averred:

"The Commission erred in making said apportionments and allocation, and in ordering plaintiff in error to make refunds as ordered, in the following respects:

• • • • • • •

"(b) The Commission's method employed in making said apportionments and allocation was erroneous, arbitrary, inapplicable and not based upon any evidence in the case.

• • • • • • •

"(d) In making the apportionment between the protesting and the non-protesting exchanges the Commission included as bonded revenues in each year the total revenues in any exchange in which any rate had been collected pursuant to bond, although substantial portions of such revenues were not collected under bond, thereby erroneously increasing by more than $4,000,000 the refunds required to be made by plaintiff in error.

• • • • • • •

"The action of the Commission with respect to such refunds and the apportionments and allocation upon which they were based deprived plaintiff in error of its property without due process of law and denied it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States."

(Petition in Error No. 25065, Appendix A, pp. 17-19.)

In its petition in error No. 25023 directed to the order of the Commission of July 5, 1934, the use of said accounting apportionments by the Commission was similarly chal-

lenged as being repugnant to the Fourteenth Amendment to the Constitution of the United States.

(Petition in Error No. 25023, pp. 18-22.)

IV. Judicial Review

The Supreme Court of Ohio, instead of exercising its own independent judgment upon the facts, treated the Commission's findings of fact as conclusive if supported by any evidence. Appellant forthwith challenged this failure of the court to accord to it the judicial review to which it was entitled, setting forth by application for rehearing (pp. 2-3):

> "4. The decision not only deprives plaintiff in error of its property without due process of law and denies it the equal protection of the laws, contrary to the Fourteenth Amendment to the Constitution of the United States in all respects heretofore presented in this consolidated cause, and now hereby reasserted, but also in that, by repeatedly accepting the Commission's findings as conclusive if supported by any evidence, the Court failed to accord plaintiff in error that full judicial review required, in cases such as this, by the Constitution of the United States as interpreted by the Supreme Court."

This application was overruled on October 7, 1936.

V. Refusal to Fix Rates for 1934 and Thereafter

The Commission found that the rates under inquiry produced in 1933, the last year of the period under investigation, no more than a fair return, but it refused to approve the rates then in effect as the just and reasonable rates to be thereafter collected until changed pursuant to law. Therefore, on February 19 and July 31, 1934, appellant filed written requests with the Commission that, in view of said findings it determine that the existing rates were no

more than just and lawful rates to be charged by it for its present and future services until modified in accordance with law, or in the alternative, for a hearing and the right to introduce evidence as to the fair value of its property, its net income and fair rate of return for the year 1934.

(Exhibit G, p. 185; Exhibit M, pp. 237-9.)

These requests the Commission denied.

(Exhibit H, pp. 187-8; Proceedings of Commission, August 1, 1934.)

This failure and refusal of the Commission and its denial of appellant's requests aforesaid were challenged by appellant, in each of its protests and applications for rehearing, as violative of the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States.

(Exhibit F, p. 163, at pp. 174-5, 182-3; Exhibit I, p. 193, at pp. 195-197, 200-201, 218-220; Exhibit P, p. 265, at pp. 269-275, 280, 299-302, 304-305; Exhibit Q, pp. 307, 308; Exhibit T, p. 327, at pp. 333-340, 350, 370, 372-374, 380.)

The denial of said protests and applications for rehearing (Exhibit H, p. 187; Order of March 9, 1934; Exhibit R, p. 311, 312; Order of October 19, 1934) was challenged as violative of the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States in each petition in error filed in the Supreme Court of Ohio. The averment of the petition in error in Cause No. 25065 (included in Appendix A hereto, pp. 33-34), which is substantially the same as that employed in all said petitions in error, is:

"The Commission erred in its findings and orders in failing to continue the existing rates of plaintiff in

error in effect for the present and future and in overruling the written requests of plaintiff in error so to do filed in this cause on February 17, July 31 and August 29, 1934.

. . . . . .

"The action of the Commission in denying plaintiff in error's request and in requiring it to render future services in Ohio at admittedly confiscatory rates has deprived plaintiff in error of its property without due process of law and denied to it the equal protection of the laws in violation of the Fourteenth Amendment to to the Constitution of the United States."

(Petition in Error No. 24694, pp. 8-10, 13-14, 31, 33 and 34; Petition in Error No. 25023, pp. 11-18, 25, 45-47 and 50.)

. . . . . .

(g) Ruling of State Supreme Court Upon Federal Questions.

The Supreme Court of Ohio affirmed the Commission's findings and orders in every respect, thereby denying every constitutional right asserted by appellant.

(h) The Federal Questions Involved are Substantial.

I. Price Trends: Undisclosed Information.

Appellant has been required to make refunds for each of the years 1926 to 1932 (aggregating more than $10,000,000) upon the basis of a value for each year fixed by means of a price trend percentage applied to the total value found for the property for the preceding year plus net additions. The information upon which the percentages were based was withheld from appellant and appellant was denied the

opportunity to examine or rebut the same. The Commission's action amounted to a denial of due process.

West v. *Chesapeake & Potomac Telephone Co.*, 295 U. S. 662;

West Ohio Gas Co. v. *Commission*, 294 U. S. 63;

Interstate Commerce Commission v. *Louisville, etc., Co.*, 227 U. S. 88, 57 L.Ed. 431, 433.

II. Disallowance of Operating Expenses.

1. *Annual Depreciation Expense.*

The Commission purported to base its allowance for the annual expense of depreciation upon appellant's retirement experience, but used for this purpose only the retirement experience of four years immediately preceding June 30, 1925, and wholly disregarded appellant's proven experience for 1925 to 1933, inclusive, the period under investigation, resulting in an aggregate allowance for that period of $8,067,266 less than appellant's net loss on account of plant retired during that period. Although, under the evidence, appellant's expense of depreciation could not fairly be limited to the amount of its annual retirement loss, even such retirement loss was not compensated for by the Commission's allowance.

Lindheimer v. *Illinois Bell Telephone Co.*, 292 U. S. 151.

2. *License Contract Payments.*

Notwithstanding the cost to the American Telephone and Telegraph Company of rendering the license contract services and the benefits to appellant were of a value greater than appellant's actual payments therefor, and notwithstanding the Commission adopted the method by which appellant arrived at its proper proportion of such cost, the Commission disallowed more than $2,800,000 of appellant's

payments to the American Company for such services from 1925 to 1932, inclusive.

Smith v. *Illinois Bell Tel. Co.*, 282 U. S. 133.

III. Refunds.

Pursuant to the Robinson and Pence Laws appellant made rates effective under separate bonds conditioned in each instance for the repayment by appellant of the portion of the increase finally determined by the Commission to be excessive. The Commission ordered refunds for 1925 to 1932, inclusive, upon a determination that appellant in its intrastate business in the aggregate, including both bonded and non-bonded rates, had received excess earnings. The refunds ordered by the Commission were arrived at by an arbitrary method of apportionment having no relation to property value or net income. The Commission made no finding of property value or net income for any exchange, bonded or non-bonded, or for the bonded exchanges as a group, or for the toll property, or that in any separate exchange or in the total exchange property or in the toll property separately there had been any excess earnings, nor did it find that any rate increased under bond was unreasonable or excessive. This was a denial of due process. The refunds ordered amounted to $11,832,264.

IV. Judicial Review.

Because the Commission's findings and orders were directly reviewed by the Supreme Court of Ohio, it was the duty of that court to exercise its independent judgment as to the facts and law. This it failed to do.

St. Joseph Stockyards Co. v. *United States*, 298 U. S. 38, 80 L. Ed. 679;

Ohio Valley Water Co. v. *Ben Avon*, 253 U. S. 287.

V. Failure to Fix Rates for 1934 and Thereafter.

The Commission found that at its existing rates appellant was earning no more than a fair return for 1933 but overruled appellant's written requests to approve such existing rates as its reasonable rates for 1934 and thereafter or accord appellant a hearing with respect thereto. Thus, the Commission has refused to bring the investigation to an end.

VI. Property Valuation.

In the following fundamental respects the Commission's order, sustained by the court, substantially undervalued appellant's intrastate property:

(a) No fair consideration was given to the cost of the property.

Los Angeles Electric Corp v. *Commission*, 289 U. S. 287.

(b) No fair consideration was given to the cost of reproduction. One basic error in this respect was the Commission's disregard of labor costs experienced by appellant and its predecessor in large, continuous construction projects during the five years preceding June 30, 1925, resulting in an undervaluation as of that date of more than $12,000,000.

Los Angeles Electric Corp. v. *Commission*, 289 U. S. 287, at page 306.

(c) There were excluded from the value as of June 30, 1925, parcels of real estate of the value of more than $500,000 acquired for use in the near future and on some of which telephone buildings were then in process of construction.

Brooklyn Borough Gas Co. v. *Prendergast*, 16 Fed. 2nd 615;

Columbus Gas & Fuel Co. v. *Columbus*, 17 Fed. 2nd 630;

Monroe, etc. Co. v. *Michigan Public Utilities Commission*, 11 Fed. 2nd 319, 323;

Denver Union Stockyards Co. v. *United States*, 57 Fed. 2nd 735.

(d) In disregard of all of the testimony, the Commission refused to include in its valuation for the year 1925 a proper amount for undistributed construction costs. Being purely arbitrary, the Commission's action resulted in a denial of due process.

Ohio Utilities Co. v. *Commission*, 267 U. S. 359;

West Ohio Gas Co. v. *Commission*, 294 U. S. 63;

B. & O. R. R. Co. v. *United States*, 264 U. S. 258;

I. C. C. v. *L. & N. R. R. Co.*, 227 U. S. 88.

(e) Although in both its findings of tentative and final value the Commission found that the property had a going value, and the tentative value made a separate allowance of $3,490,905 therefor, the final findings gave no recognition to that value either separately or as a part of the total.

Los Angeles Gas & Electric Corp. v. *R. R. Comm. of California*, 289 U. S. 287;

McCardle v. *Indianapolis Water Co.*, 272 U. S. 400, 413.

(f) The Commission excluded from the rate base construction work in progress, averaging $3,000,000 annually, representing capital invested to meet the public demand for additional service. Funds invested in such construction work in progress are devoted to the public service just as is money invested in completed plant and in materials and supplies.

(g) For the years, 1926 to 1933, the Commission's findings of value were arrived at by the use of the undisclosed price trend information heretofore referred to.

West v. *Chesapeake & Potomac Telephone Co.*, 295 U. S. 662;
West Ohio Gas Co. v. *Commission*, 294 U. S. 63;
Interstate Commerce Commission v. *Louisville R. Co.*, 227 U. S. 88.

(h) The Commission's finding of $14,226,709 of existing depreciation in appellant's property as of June 30, 1925, was excessive by $3,000,000, as shown by the evidence.

Respectfully submitted,

THE OHIO BELL TELEPHONE COMPANY,

By KARL E. BURR,
W. H. THOMPSON,
W. B. STEWART,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Its Attorneys.

APPENDIX A.

Opinion of the Supreme Court of Ohio.

THE OHIO BELL TELEPHONE CO. v. PUBLIC UTILITIES COMMISSION OF OHIO. (Four cases.)

Public Utilities Commission—State-wide valuation of telephone company for determining rates—Price trends and judicial notice of economic conditions—Investment in construction work in progress—Cost and reproduction cost—Operating expenses—License contract service—Depreciation—Current maintenance, repairs, replacements and improvements—Rate of return—General normal economic conditions and during depression.

(Nos. 24694, 24695, 25023 and 25065—Decided July 22, 1936.)

ERROR to the Public Utilities Commission.

Plaintiff in error, The Ohio Bell Telephone Company, has filed in this court petitions in error in causes numbered 24694, 24695, 25023 and 25065, wherein the company seeks to reverse the findings and orders of the Public Utilities Commission of Ohio entered on January 16, March 1, July 5, July 9 and September 6, 1934. For the purposes of convenience in the consideration of these causes by this court all of them have been consolidated into this cause.

Throughout this statement and opinion the plaintiff in error, The Ohio Bell Telephone Company, will be referred to as "the company," and the defendant in error, The Public Utilities Commission of Ohio, will be referred to as "the commission."

The commission's order of January 16, 1934, corrected by its order of March 1, 1934, fixed a final valuation of the intrastate property of the company at $93,707,488 as of June 30, 1925, the "date certain." The value for each succeeding year to and including 1933 was also fixed by the commission. The order also required the company to refund to its patrons in the state of Ohio the sum of $13,289,172, which amount the commission found to be the excess earnings of the company's entire intrastate operations for the years 1925 to 1932, inclusive, and further directed the company to file a schedule of reduced rates effective as of June

30, 1925, and thereafter until changed by order of the commission.

Thereafter the commission made two reductions in the amount of the refunds as originally ordered. The first reduction of $1,121,494 was made in the order of July 5, 1934, for the reason that a part of the excess earnings found by the commission to have been collected by the company were referable to rates not collected under bond, and under the laws of Ohio could probably not be ordered refunded. The second reduction in the sum of $355,414 was made in the commission's order of September 6, 1934, to correct an error. The amount of the refunds was finally fixed by the commission in its order of September 6, 1934, at $11,832,264, with interest.

In its order of July 9, 1934, the commission required the company to show cause why its future rates should not be reduced.

The proceedings presented for review arise out of the action of the commission in what has come to be known as the state-wide case of The Ohio Bell Telephone Company, being properly so designated because it involved an inquiry into the value of the property and rates of that company for both exchange and toll service throughout the state of Ohio.

Prior to the year 1914, Bell System service in Ohio was limited to the portions of the state served by the Cleveland Telephone Company, the Central Union Telephone Company, the Central District Printing & Telegraph Company and the Cincinnati & Suburban Bell Telephone Company (the latter still operating as a separate company). At the same time and operating independently in the same territory in many localities were other telephone companies.

In July, 1914, a number of companies of the kind last referred to were consolidated under the name of The Ohio State Telephone Company. In December, 1920, the Cleveland Telephone Company (its name having been changed to The Ohio Bell Telephone Company) purchased the Ohio property of Central Union Telephone Company. In September, 1921, The Ohio Bell Telephone Company and The Ohio State Telephone Company were consolidated as The

Ohio Bell Telephone Company and that company thereafter purchased additional telephone properties. Even after these extensive consolidations there remained more than four hundred and fifty other independent telephone companies operating in the state.

As soon as The Ohio Bell Telephone Company (consolidated) was ready to unify the service in communities having a dual service, it filed with the commission an application to determine the rates chargeable for such unified service. In the case of some of the exchanges the municipalities concerned contested the proposed rates and a hearing was instituted. Subsequently, following the 1923 amendment of Section 614-20 of the General Code of Ohio (110 Ohio Laws, 366), the company filed new rate schedules for many of its exchanges; some of which were protested by the municipalities concerned and were collected under bond, after the end of the statutory period of suspension. This was true also with respect to the company's new schedule of toll rates for its toll service throughout the entire state.

As a result many extensive hearings were had by the commission, and in the two years prior to October, 1924, several thousand pages of testimony were taken and an even greater number of pages of exhibits offered in evidence.

On October 14, 1924, the commission, having found that many issues were common to all of the then pending Bell cases, both toll and exchange, ordered that they be consolidated and that the examination into the rates proceed as a single state-wide case involving all the rates and services, exchange and toll, of The Ohio Bell Telephone Company, including those then under investigation, and that the evidence theretofore introduced, in the several separate cases, be considered and made a part of the record in the consolidated cases.

This order concluded as follows:

"Ordered, that, on or before December 1, 1924, said The Ohio Bell Telephone Company furnish to this commission and file in this cause, as a part of the evidence

therein, a complete inventory of all of its property located in the state of Ohio and used and useful and to be used and useful, in the furnishing of telephone service therein, both toll and exchange, classified according to the classification adopted and prescribed by this commission and the Interstate Commerce Commission for telephone companies, and that, upon the filing of such inventory, this consolidated case proceed to a hearing for the determination of the fair value of said property and of the just and reasonable rates for the service thereby to be furnished by said company to its patrons throughout the state of Ohio."

By this order, forty-three separate cases then pending, the majority of which were for increased rates, were consolidated into the state-wide case.

Since the order of consolidation the company has made additional filings of exchange rates. Some were protested and are now collected under bond.

The company filed and offered in evidence an inventory and appraisal of its entire property.

In February, 1927, the case was submitted to the commission for the fixing of a tentative value, but before this valuation was announced, the then attorney general requested that the case be reopened and further valuation testimony taken.

Following that date much time was consumed in taking testimony on behalf of the state, with rebuttal evidence on behalf of the company, and in April of 1930 the case was again submitted to the commission for its finding on tentative value. This tentative valuation finding was issued on January 10, 1931, and in such finding the commission found the present value of the total property of the company as of June 30, 1925, to be $104,282,735.

On February 7 and February 9, 1931, protests to this finding were filed on behalf of the company and the state, respectively. Hearings on the protests were held on March 3 and 4, 1931. At that time counsel for the company was preparing exhibits to show Western Electric profits, cost of license contract services rendered by the American Telephone & Telegraph Company, and separation of plant, revenues, and expenses, as between interstate and intrastate

usage in accordance with the interpretation which counsel placed upon the decision of the Supreme Court of the United States in the case of *Smith et al., Commerce Comm., v. Illinois Bell Telephone Co.*, 282 U. S., 133, 75 L. Ed., 255, 51 S. Ct., 65.

On April 15, 1931, hearings were resumed for the presentation of this testimony proffered by the company.

On June 17 and 18, 1931, during the cross-examination of Charles A. Heiss, comptroller of American Telephone & Telegraph Company, and R. H. Gregory, comptroller of Western Electric, certain requests were made for detailed information underlying their exhibits and testimony. In July of that year the company furnished certain data in accordance with its version of these requests.

A hearing was had on September 28, 1931, on the requests, and a few days later a revised list, dated October 1, was submitted.

On December 5, 1931, the company filed a brief, styled "memorandum responsive to state's official request for information." A reply to the company memorandum was filed with the commission on December 28, 1931. The matter again came on for hearing on January 27, 1932.

On April 22, 1932, the commission issued its order in regard to the requests, approving some, denying others, and directing the attorney general and the company to expedite the proceedings.

The company continued to furnish data in compliance with this last order, the last being received on June 22, 1932. Practically all of the data requested related to American Telephone & Telegraph Company and Western Electric Company.

During the entire year 1932 the Illinois case was going forward, volumes of testimony and exhibits being introduced at hearings before Judge Wilkerson, as a result of the decision of the Supreme Court of the United States remanding that case to the statutory court for further findings. This evidence so introduced in the Illinois case related to the same general issues that were being presented to the Ohio commission.

Hearings were concluded and that record closed early in the fall of 1932, and all of the issues thoroughly briefed by counsel on each side. Five days were allotted early in December for oral argument before the full statutory court of three judges, at which time that case was submitted for decision.

Subsequently it was found that the material furnished by the company in professed compliance with the request made in June was inadequate and not responsive.

A great deal of time would have been necessary to formally introduce the same or similar testimony into the record of this case, so when hearings were resumed in this case on December 19, 1932, before the commission, a stipulation was worked out between counsel to file therein the testimony and exhibits in the Illinois case in so far as it related to the four issues, namely, Western Electric profits, American Telephone & Telegraph license contract service costs, separation of interstate and intrastate plant, revenues and expenses, and rate of return. As a result of this stipulation many days of hearing were saved. The stipulation provided, in substance, that the new record made in the Illinois case be incorporated in this record covering the testimony of certain specified witnesses and exhibits introduced through them and it also provided that all such evidence was introduced subject to the same objections made in the Illinois case. Certain additional exhibits relating to the Ohio company were introduced by stipulation, such exhibits having been prepared in the same manner as their correspondingly numbered exhibits in the Illinois case. The stipulation further provided for the introduction into this record of the requests made on behalf of the state, heretofore referred to, and the material furnished by the company in response thereto.

On December 29, 1932, the record in this case was closed on the introduction of certain testimony and exhibits of company witnesses and E. W. Wood on behalf of the state. Subsequently, under date of January 16, 1934, the commission made and entered its final order in this case, fixing the value of the property of The Ohio Bell Telephone Company as of June 30, 1925, the date certain in this case, and

for each of the years subsequent thereto, through the year 1932. Thereafter the commission's orders of March 1, July 5, July 9 and September 6, 1934, heretofore described, followed.

The orders of the commission provide for refunds in forty-four Ohio municipalities to more than 500,000 telephone subscribers.

The petition in error of The Ohio Bell Telephone Company is in the words and figures following:

"A

"The Ohio Bell Telephone Company, plaintiff in error, is and has been continuously since the 20th day of September, 1921, a corporation duly organized under the laws of Ohio.

"Continuously since said date plaintiff in error has owned and operated a telephone system now consisting of one hundred and sixty-two local exchanges serving various cities and towns in said state with more than 530,000 connected subscribers stations, and of toll lines, by means of which system plaintiff in error has been during all of said period and is now engaged in the business of transmitting to, from, through and in said state telephonic messages, and has been and now is a public utility within the meaning of the General Code of Ohio.

"The defendant in error, The Public Utilities Commission of Ohio, hereinafter referred to as the 'Commission,' is now and has been continuously since 1913 an administrative body created by the laws of the State of Ohio.

"B

"This proceeding in error is brought to obtain a reversal, upon the grounds hereinafter stated, of the findings and order of the Commission made and entered on September 6, 1934, as well as the findings and orders of the Commission of January 16, March 1, July 5 and 9, 1934, (heretofore complained of in Causes Nos. 24694, 24695 and 25023 upon the dockets of this Court) in so far as said findings and orders form the basis for or are incorporated into said findings and order of September 6, 1934.

"The order of September 6, 1934, is the latest of a series of orders entered by the Commission in Cause No. 3307, which cause, inaugurated October 14, 1924, upon the Commission's own motion, is an investigation and inquiry to determine the fair value of the property of The Ohio Bell Telephone Company and to fix just and reasonable rates, rules and regulations for its service.

"The order of September 6, 1934, requires plaintiff in error to refund what the Commission found to be excess charges for its exchange services rendered during the years 1925 to 1932 inclusive, in the sum of $11,423,137, and for its toll service for the years 1925 and 1926, the sum of $409,127, or a total of $11,832,264. The order fixes the amounts to be repaid to the subscribers in each of 44 exchange areas listed in Schedule A of said order and in the toll system and requires such repayment to be made within 90 days.

"C

"A brief history of the proceedings before and the findings and orders entered by the Commission, in so far as essential to the questions presented by this petition in error, is as follows:

"1. Prior to October 14, 1924, plaintiff in error or its predecessor had filed with the Commission pursuant to the provisions of the Robinson and Pence laws, respectively (108 Ohio Laws 1094 and 110 Ohio Laws 366), a number of separate schedules of increased rates for certain classes of its service in separate exchanges, and a schedule of increased rates for parts of its toll service. In some instances protests had been filed against such schedules as provided in said Robinson and Pence laws, and each such protest had been made the subject of a separate case on the docket of the Commission. In each such separate case the Commission had suspended the effective date of the schedule and had entered upon a hearing concerning the fair value of plaintiff in error's property in such exchange and the propriety of such rates, and thereafter said rates had become effective pursuant to a separate bond filed with and approved by the Commission in each such case, conditioned

for the repayment by plaintiff in error of the portion of such increased rates finally determined by the Commission to be excessive. In each such case plaintiff in error was proceeding to show separately the fair value of its property and its net income and that the rates so made effective under bond were not excessive.

"2. On October 14, 1924, before any such case had been concluded, the Commission on its own motion instituted a company-wide investigation of the value of plaintiff in error's entire property and the reasonableness of its rates, and consolidated with said company-wide investigation (No. 3307) all of the then pending separate cases.

"3. Thereafter plaintiff in error filed separate schedules of increased rates for certain classes of its service in other exchanges, some of which schedules were in like manner suspended by the Commission, became effective under separate bond and were consolidated with said company-wide investigation. There are pending and undisposed of forty-five of such separate exchange cases and one such toll case, in which cases plaintiff in error has on file with the Commission bonds aggregating more than $14,000,000.

"4. Instead of determining said exchange and toll cases separately, the Commission in its said several orders herein referred to, has ordered plaintiff in error to make refunds based upon the Commission's findings of value of plaintiff in error's intrastate property as a single unit and of its aggregate net income therefrom, without having found or determined the fair value of plaintiff in error's property or the amount of its net income in respect of any separate exchange or its toll system, and without having found for any year or years that any portion of any rate was excessive.

"5. The Commission's first order, entered on January 10, 1931, tentatively fixed the fair value of plaintiff in error's total property, including the interstate portion thereof, as of June 30, 1925, at $104,282,735.

"6. On January 16, 1934, the Commission made its findings of final value for plaintiff in error's intrastate property as of June 30, 1925, by deducting from its tentative find-

ing the sum of $2,714,788 on account of the interstate property, and by further reducing such tentative finding in the following amounts, without any change in the pertinent evidence:

"(a) By deducting the sum of $316,090 from the allowance for right of way;

"(b) By eliminating the sum of $3,490,905 on account of going concern value;

"(c) By reducing the allowance for working capital, including materials and supplies, by the sum of $535,970; and

"(d) By deducting the sum of $8,296,181 from the amount of undistributed construction expenditures.

"The Commission's finding of final value of the intrastate portion of plaintiff in error's property as of June 30, 1925, was thus $93,707,488 or $7,639,146 lower than its finding of tentative value.

"The Commission also found the value of plaintiff in error's property for each succeeding year to 1933 by the application of price trends hereafter referred to.

"In the same order the Commission found that plaintiff in error had collected excess charges for its intrastate telephone service for the years 1925 to 1932, inclusive, in the aggregate sum of $13,289,172 and ordered plaintiff in error to refund to its subscribers said entire sum, with interest, and to file with the Commission a schedule of reduced rates for its telephone service effective retroactively as of June 30, 1925, and thereafter until changed by the order of the Commission.

"7. The Commission has consistently found that for the year 1933 plaintiff in error had earned no excess income, and therefore no refund has been ordered for that year.

"8. Pursuant to said orders of January 16 and March 1, 1934, plaintiff in error, on April 17, 1934, submitted to the Commission, under a written protest, certain 'Rate and Revenue Data and Estimates' hereafter referred to.

"9. On July 5, 1934, the Commission made another order wherein it found that plaintiff in error had collected under bond in protesting exchanges and for its intrastate toll services, excess charges for the years 1925 to 1932, inclusive, in the aggregate amounts of $11,423,137 in such exchanges and $744,541 for such toll services, or a total of $12,167,678; being $1,121,494 less than the amount ordered refunded in its former orders.

"Said order required plaintiff in error to show cause upon August 1, 1934, why said refunds should not be ordered.

"10. On July 9, 1934, the Commission ordered plaintiff in error to show cause by August 1, 1934, why a further order should not enter adopting and substituting for plaintiff in error's existing schedules of rates, 'said first or said second revision of existing schedules' of plaintiff in error (referring to the hypothetical rate calculations contained in the 'Rate and Revenue Data and Estimates' furnished by plaintiff in error under protest as aforesaid).

"11. On September 6, 1934, the Commission entered the order herein complained of, wherein it found that plaintiff in error had collected under bond in protesting exchanges and from its intrastate toll services, excess charges for the years 1925 to 1932, inclusive, in the aggregate amounts of $11,423,137 in such exchanges and $409,127 from such toll services, or a total of $11,832,264, being $1,456,908 less than the amount ordered refunded in said orders of January 16 and March 1, 1934, and $335,414 less than the amount ordered refunded in the order of July 5, 1934; and ordered plaintiff in error to make repayment to its subscribers; all as set forth in said order and in Schedule A thereof. In its finding of September 6, 1934, the Commission stated that all prior findings and orders, pertaining to excess charges, conflicting with said finding of September 6, 1934, should be modified to conform to it.

"D

"Plaintiff in error, within the time required by law, appropriately challenged each of the findings, orders and

rulings of the Commission and made certain written requests upon it, as follows:

"1. On February 7, 1931, protest to finding of tentative value of January 10, 1931, was filed by plaintiff in error. It was overruled by the Commission in its order of January 16, 1934.

"2. On February 6, 1934, plaintiff in error filed its application and petition for a rehearing with respect to the order of January 16, 1934. It was overruled by the Commission in its order of March 1, 1934.

"3. On February 17, 1934, plaintiff in error filed with the Commission its application and request:

> "(a) That the Commission modify said findings and order of January 16, 1934, by finding that the rates charged by plaintiff in error are just and lawful rates and by establishing such rates as the rates thereafter to be charged by plaintiff in error for its services until changed or modified in accordance with law; (b) that the Commission permit plaintiff in error in accordance with the request theretofore made by it and thereby renewed, to introduce evidence of the fair value of its property and its net income in each of the said separate causes, and (c) that the Commission afford plaintiff in error an opportunity to examine, analyze, explain and rebut the price trend information considered by the Commission in arriving at said findings and order, which information was at no time exhibited to plaintiff in error or introduced in any open hearing or made a part of the record in said cause and to which information plaintiff in error has never had access.

This request was overruled by the Commission in its order of March 1, 1934.

"4. On March 9, 1934, plaintiff in error filed its protest, application and petition for a rehearing with respect to the order of March 1, 1934, and on the same day the Commission overruled the same.

"5. On April 17, 1934, pursuant to said orders of January 16 and March 1, 1934, plaintiff in error duly submitted to the Commission under written protest certain 'Rate and Revenue Data and Estimates' heretofore referred to.

"6. On July 31, 1934, plaintiff in error filed:

"An application and request, directed to the order of July 5, 1934, (a) for permission to inspect and rebut the undisclosed price trend information hereinabove in paragraph 3(c) referred to; (b) for a disclosure of the Commission's methods of apportionment and allocation employed in arriving at the refunds found therein; and (c) for the opportunity to introduce separate evidence in the separate bond cases as hereinbefore set forth;

"An application and request directed to the order of July 9, 1934, that the Commission fix plaintiff in error's present rates as the rates for its future service or, if the Commission intended to reduce its present rates, to permit plaintiff in error to show that the reduced rates proposed by the Commission would reduce the plaintiff in error's net income for the year 1934 by $1,800,000 and permit it to earn less than 3½ per cent upon the fair value of its intrastate property for 1934;

"Verified return to the rule to show cause contained in the order of July 5, 1934;

"Verified return to the rule to show cause contained in the order of July 9, 1934;

"Protest of plaintiff in error against orders of July 5 and 9, 1934, and application and petition for rehearing with respect to said orders.

"7. On August 1, 1934, the Commission overruled plaintiff in error's said application to establish its present rates as its rates for the future and on September 6, 1934, overruled all of the other applications, protests, petitions and returns referred to in paragraph 6.

"8. On August 29, 1934, plaintiff in error filed its protest against the Commission's ruling of August 1, 1934, and its further application and petition for a rehearing.

"9. On September 25, 1934, plaintiff in error filed with the Commission its application and request with respect to the Commission's order of September 6, 1934;

"a. To permit plaintiff in error, in accordance with the requests theretofore made by it, to introduce separate evidence in respect of each of the separate bond cases;

"b. To permit plaintiff in error to examine and rebut the price trend information hereinabove in paragraphs (3) and (6) referred to; and

"c. To make a disclosure with respect to the instructions of the Commission to its accountant, Wood, and his use of such instructions in making the apportionment of excess earnings.

"This application was denied by the Commission on September 27, 1934.

"10. On October 1, 1934, plaintiff in error filed with the Commission its protest against said order of September 6, 1934, and its application and petition for a rehearing of this cause which was denied on October 19, 1934.

"11. On October 1, 1934, plaintiff in error also filed with the Commission its application for a stay of the order of September 6, 1934, which application the Commission denied on October 19, 1934.

"Each and all of the exhibits, 'A' to 'U,' above referred to are hereby incorporated herein and made a part hereof.

"E

"In said proceedings, acts, findings and orders, the Commission erred, as follows:

"1. In basing its said findings of value and orders upon alleged material and labor cost prices and trends obtained from various sources without plaintiff in error's knowledge, and not offered or introduced in evidence in any

open hearing or made a part of the record in this case and to which plaintiff in error never had access and as to which it had no opportunity to cross examine, explain or rebut, as follows:

"(a) Cost prices for several years furnished by unidentified manufacturers of telephone equipment;

"(b) The trend of land values allegedly ascertained from an examination of tax valuations in certain of the large cities of Ohio, the names of which cities were undisclosed;

"(c) Building cost trends taken from the Engineering News Record;

"(d) Labor cost trends from the same publication;

"(e) Other labor and material cost trends obtained from various undisclosed sources.

"The Commission having fixed the fair value of plaintiff in error's property as of June 30, 1925, thereupon erroneously used the price trends obtained from the sources above referred to in fixing the fair value of plaintiff in error's intrastate property, for each of the years 1926 to 1933, both inclusive.

"The alleged facts so considered did not come from any official source which the Commission had the right to notice judicially. They were not published by any public authority, governmental or state. They were not introduced in evidence, and plaintiff in error had no opportunity to examine or cross examine as to such claimed proof or to explain or rebut the same, or to show that such claimed price trends could not fairly be considered in determining the fair value of plaintiff in error's property. By reason of these facts the Commission denied plaintiff in error a fair hearing and in determining this case admittedly considered and gave controlling weight to evidence not introduced in any hearing.

"On February 17, July 31 and September 25, 1934, plaintiff in error filed the written requests heretofore referred to, each of which in specific terms asked the Commission to disclose the evidence on which it had arrived at

the price trends above referred to and had fixed the value of plaintiff in error's intrastate property. These requests were all denied. The Commission mistakenly stated in its order of September 6, 1934, that plaintiff in error had been accorded ample opportunity to examine and consider all necessary and pertinent evidence. The record, however, is undisputed that plaintiff was never granted access to or an opportunity to examine any of the price trend information above referred to upon which the value of plaintiff in error's property for the years 1926 to 1933 was fixed.

"The findings of value and the orders of the Commission fixing the amount of the refunds, aggregating $11,832,264, which were necessarily based upon such claimed proof deprive plaintiff in error of its property without due process of law and deny to plaintiff in error the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States; and said findings and orders are therefore void in their entirety.

"2. Plaintiff in error was deprived of its property without due process of law and denied the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States by the order of the Commission of September 6, 1934, ordering plaintiff in error to refund to its exchange and toll subscribers the amounts set forth therein, because:

> "The Commission refused to receive evidence showing separately for each year the fair value of plaintiff in error's property and net income and fair rate of return with respect to each separate exchange and plaintiff in error's toll system where rates had become effective pursuant to bonds as provided in the Robinson and Pence laws notwithstanding repeated written requests of plaintiff in error to introduce such evidence and repeated requests that a date be fixed for hearing the same.

"Said refunds therefore were ordered erroneously, arbitrarily and without any evidence upon which they can be sustained.

"3. Plaintiff in error's rates throughout the period in controversy in said cause were of two kinds:

"Those filed with the Commission and, following the statutory protest, made effective pursuant to bond approved by the Commission, as provided in the Robinson and Pence laws;

"Those filed with the Commission and, in the absence of such protest, made effective without bond or other condition.

"In fixing the amount of the refunds attributable to the bond cases, the Commission made certain apportionments and an allocation as follows:

"1st. An apportionment of the alleged excessive earnings of plaintiff in error for the years 1925 to 1932, inclusive, in the sum of $13,289,172 between protesting exchanges, that is to say, exchanges wherein any rate had been collected under bond in any of the aforementioned years, and non-protesting exchanges, that is to say, exchanges wherein no rate had been so collected;

"2nd. An allocation of $409,127 to plaintiff in error's toll system and of $11,423,137 to its protesting exchanges; and

"3rd. An apportionment of the sum of $11,423,137, the amount required to be refunded in its protesting exchanges, among said several exchanges.

"The Commission erred in making said apportionments and allocation, and in ordering plaintiff in error to make refunds as ordered, in the following respects:

"(a) It had no authority to require plaintiff in error to make refunds with respect to rates collected under bond without determining the fair value of plaintiff in error's property and its net income for each of its protesting exchanges separately and for its toll system. This the Commission refused to do. Instead, it arbitrarily used and applied accounting methods having no relation to property values and net earnings.

"(b) The Commission's method employed in making said apportionments and allocation was erroneous, arbitrary, inapplicable and not based upon any evidence in the case.

"(c) In arriving at the portion of excess earnings to be refunded both in exchanges and in the toll system, the Commission considered exchange service revenues only and ignored toll revenues. Its error in this respect was two-fold: first, plaintiff in error during the period involved received large revenues from its intrastate toll system and these revenues were disregarded in making the apportionment; second, the use of revenues as a basis is wholly improper because revenues are in no sense evidence of net earnings.

"(d) In making the apportionment between the protesting and the non-protesting exchanges the Commission included as bonded revenues in each year the total revenues in any exchange in which any rate had been collected pursuant to bond, although substantial portions of such revenues were not collected under bond, thereby erroneously increasing by more than $4,000,000 the refunds required to be made by plaintiff in error.

"(e) Plaintiff in error was required to make refunds in excess of $400,000 in respect of its intrastate toll system for the years 1925 and 1926 although the Commission made no determination of the fair value of the intrastate toll property or its net income or that any toll rate was excessive.

"(f) The Commission did not find that any of plaintiff in error's exchange or toll rates collected under bond was unreasonable or excessive for any year. Without such finding the Commission could not under the applicable Ohio statutes lawfully order any refund.

"(g) The Commission used an arbitrary method in ordering said refunds, viz: for each of the years in controversy a refund for each exchange, based in each instance upon the same percentage of the amount of

the increases in rates collected under bond, which basis was wholly without support in the evidence.

"(h) In making its apportionment of excessive earnings between protesting and non-protesting exchanges the Commission used the basis of total exchange service revenues. This method was necessarily based upon the assumption that there was included in each dollar of such total exchange service revenues an equal amount of excess net earnings. In its subsequent apportionment and allocation, the Commission abandoned this method and the necessary assumption upon which it was based and ordered refunds to the extent of $4,640,364 more than would have resulted from a consistent application of the first method.

"The action of the Commission with respect to such refunds and the apportionments and allocations upon which they were based deprived plaintiff in error of its property without due process of law and denied it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"4. The findings and orders of the Commission deprive plaintiff in error of its property without due process of law and deny to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States, in that therein the Commission found:

"(a) That the fair value of plaintiff in error's intrastate property used and useful in the service of the public was the following amounts as of the following dates respectively:

June 30, 1925,	$ 93,707,488
December 31, 1926,	101,767,774
December 31, 1927,	111,036,522
December 31, 1928,	122,417,735
December 31, 1929,	134,765,576
December 31, 1930,	145,683,047
December 31, 1931,	145,271,663
December 31, 1932,	133,625,655
November 30, 1933,	126,250,206

"(b) That the net income of plaintiff in error from its intrastate business available for return upon said property was the following amounts for the following years:

1925	$ 8,382,171
1926	9,165,227
1927	9,759,167
1928	10,494,542
1929	10,896,937
1930	10,951,087
1931	11,102,418
1932	8,257,746
1933	6,959,232

"(c) That the reasonable rates of return which plaintiff in error was entitled to earn upon said intrastate property were the following percentages for the following years:

1925 to 1929, inclusive	7 per cent per annum
1930 to 1931, inclusive	6½ per cent per annum
1932 and 1933	5½ per cent per annum

"(d) In its finding and order of September 6, 1934, the Commission found that plaintiff in error had collected excess charges under bond in protesting exchanges and in its intrastate toll system in the following amounts:

	Exchange	*Toll*
1925	$1,137,195.00	$232,282.00
1926	1,637,314.00	176,845.00
1927	1,823,857.00	.....
1928	1,772,238.00	.....
1929	1,344,624.00	.....
1930	1,357,589.00	.....
1931	1,519,405.00	.....
1932	830,915.00	.....
	$11,423,137.00	$409,127.00

"Upon such findings so made, the Commission on said date ordered plaintiff in error to refund said alleged excessive earnings in said respective amounts of $11,423,137 and $409,127, or an aggregate amount of $11,832,264, together with interest thereon at the rate of six per cent (6%) per annum from the date of payment until the date of refund.

"The findings and orders of the Commission are erroneous, arbitrary, unreasonable, invalid and confiscatory of plaintiff in error's property in that the fair value of plaintiff in error's said intrastate property in each of the years 1925 to 1933 inclusive was largely in excess of the amounts so found by the Commission therefor; plaintiff in error's net income was in each of said years substantially below the amounts found by the Commission as such; the rates of return actually earned by plaintiff in error were substantially lower than those which the Commission found plaintiff in error had earned in each of said years, and the return to which plaintiff in error was reasonably entitled was substantially in excess of that found by the Commission to be fair for said years, respectively, and plaintiff in error had no excessive or unreasonable net income in any of said years, all as more particularly shown in Specifications of Error Nos. 5, 6, 7 and 8, *infra*.

"5. The Commission should have found that the minimum fair value of plaintiff in error's intrastate property was at least $30,000,000 in excess of the values found by the Commission, set forth in (a) of Specification of Error No. 4, for each of the dates therein set forth.

"6. The Commission, instead of finding plaintiff in error's net income to be as set out in (b) of Specification of Error No. 4, should have found that plaintiff in error's net income from its intrastate business available for a return, was in no year excessive and was not more than the following amounts in each of the following years:

"1925, $6,014,180; 1926, $6,726,922; 1927, $7,260,885; 1928, $8,266,094; 1929, $8,200,940; 1930, $8,068,933; 1931, $8,115,568; 1932, $7,086,738; 1933, $6,160,952.

"7. The Commission erred in finding that plaintiff in error's net income from its intrastate business equalled an annual earning at the following rates upon the value of its intrastate property used and useful in furnishing its service in the State of Ohio for each of the following years, viz:

> "1925, 8.95 per cent; 1926, 9.01 per cent; 1927, 8.79 per cent; 1928, 8.57 per cent; 1929, 8.09 per cent; 1930, 7.52 per cent; 1931, 7.64 per cent; 1932, 6.18 per cent; 1933, 5.51 per cent.

"The rates of return so found by the Commission are higher than the rates of return actually earned by plaintiff in error upon such property, in that, as shown by the evidence, the Commission found the fair value of plaintiff in error's intrastate property in each of such years to be too low as shown in Specification of Error No. 5 hereof, and found plaintiff in error's net income for each of such years to be substantially higher than it actually was, as shown in Specifications of Error Nos. 4(b) and 6 hereof.

"The Commission should have found, in accordance with the evidence in this case, that the rates of return actually earned by plaintiff in error upon such property during each of said years were substantially less than the rates of return found by the Commission to be reasonable for said years, respectively, as hereinafter in Specification of Error No. 8 set forth.

"8. The Commission erred in finding that plaintiff in error was entitled to earn upon the fair value of its intrastate property only the following annual rates of return for the following years:

1925 to 1929, inclusive,	7 per cent per annum;
1930 to 1931, inclusive,	6½ per cent per annum;
1932 and 1933,	5½ per cent per annum.

"The Commission should have found upon the evidence that the rates of return at which plaintiff in error was entitled to earn upon the fair value of its said property in each of said years were substantially in excess of said rates of return hereinabove last set forth, respectively. In this

respect the said orders of the Commission deprive plaintiff in error of its property without due process of law and deny to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"9. The Commission erred in arriving at the fair value of plaintiff in error's intrastate property for each of the years 1925 to 1933, inclusive, by erroneously evaluating plant items manufactured by Western Electic Company and included in plaintiff in error's telephone plant in each of the following respects:

"(a) The Commission developed a trend for Western Electric prices from the prices of that company for telephone apparatus only and then applied such trend not only to plaintiff in error's telephone apparatus but to its lead covered cable and materials and supplies. This action resulted in undervaluing plaintiff in error's property.

"(b) The Commission having determined certain price trends for labor and material based upon the experience of manufacturers other than the Western Electric Company, applied such price trends to plaintiff in error's plant items of Western Electric manufacture, although it conclusively appeared from the evidence that Western Electric Company's prices were lower than the prices charged by other manufacturers for comparable materials and lower than the prices charged by Western Electric Company for the same materials to others, and that Western Electric Company's earnings in its Bell business were at all times reasonable.

"(c) The Commission refused to give effect to an increase of approximately ten per cent in the price of telephone apparatus made by Western Electric Company under the following circumstances:

"The evidence showed that commencing with December 31st, 1920, and continuing until July 1st, 1929, Western Electric Company made reductions in the prices charged by it to plaintiff in error and other Bell Associate Com-

panies for telephone apparatus, so that on July 1st, 1929, the level of the prices for such telephone apparatus was only 58.3 per cent of what it had been on the 31st day of December, 1920. These reductions in prices by Western Electric Company were made at a time when other manufacturers were maintaining or increasing their prices. The reductions in 1929 were made in anticipation of a large increase in Western's business which was not realized, and consequently, in November, 1930, Western Electric Company restored the prices which had been in effect in 1928. With such increased prices Western Electric Company earned only 4.6 per cent and 4.2 per cent on its investment in its Bell business for the years 1930 and 1931, respectively, and the evidence showed that it would sustain a loss in such business of approximately $6,400,000 in 1932. The Commission's action in rejecting such price increase can not be justified on the basis that Western's earnings in its Bell business were at any time unreasonable or its prices excessive. Its action in rejecting such price increase was unlawful and unreasonable and resulted in a substantial undervaluation of plaintiff in error's intrastate property for each of the years 1930, 1931, 1932 and 1933.

"10. The Commission erred in arriving at the fair value of plaintiff in error's intrastate property for each of the years 1925 to 1933, inclusive, by failing to give proper consideration and weight to the actual costs of such property as such costs are correctly reflected in plaintiff in error's books and shown by the evidence.

"The actual cost of plaintiff in error's intrastate property (including cash working capital and materials and supplies as fixed by the Commission in said orders, but exclusive of construction work in progress) were the following sums as of the following dates respectively:

Date	*Book Costs*
June 30, 1925,	$98,798,259
December 31, 1926,	111,044,696
December 31, 1927,	126,725,311
December 31, 1928,	136,883,155
December 31, 1929,	150,330,971

Date	*Book Costs*
December 31, 1930,	162,820,788
December 31, 1931,	164,932,754
December 31, 1932,	162,480,450
November 30, 1933,	161,809,034

"11. The Commission erred in finding in its order of September 6, 1934, that plaintiff in error in the period 1925 to 1932, inclusive, had imposed, charged and collected pursuant to bond from the subscribers and patrons of its intrastate services, exchange and toll, within the State of Ohio, the sum of $11,832,264 in excess of a fair return upon the fair value of its property and in ordering that plaintiff in error refund within ninety days therefrom the following amounts for the following years, to-wit:

	Exchange	*Toll*
1925	$1,137,195.00	$232,282.00
1926	1,637,314.00	176,845.00
1927	1,823,857.00	.....
1928	1,772,238.00	.....
1929	1,344,624.00	.....
1930	1,357,589.00	.....
1931	1,519,405.00	.....
1932	830,915.00	.....
TOTAL	$11,423,137.00	$409,127.00

"There was no evidence in the case which justified any finding by the Commission that any refund should be made in any exchange or in the toll system with respect to any of the years in question, and no basis upon which the Commission's order for such refund can be sustained. The order of the Commission in this respect deprives plaintiff in error of its property without due process of law and denies it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"12. The Commission erred in its order of January 16, 1934, in reducing, without any change in the pertinent evidence, the unreasonably low value of plaintiff in error's intrastate property as of June 30, 1925, as tentatively fixed

by it in its order of January 10, 1931, in the following respects and by the following amounts:

"(a) By deducting the sum of $316,090 from the allowance for right of way;

"(b) By eliminating the sum of $3,490,905 on account of going concern value;

"(c) By reducing the allowance for working capital including materials and supplies, by the sum of $535,970;

"(d) By excluding and deducting the sum of $3,296,181 from the amount of the undistributed construction expenditures.

"In each of the foregoing respects, the said findings and orders of the Commission deprive plaintiff in error of its property without due process of law and deny to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"13. The Commission erred in said findings and orders by failing to include any allowance for the going concern value of plaintiff in error's intrastate property in any year. In its tentative value order of January 10, 1931, the Commission found that the element of going value amounted to $3,592,040, which amount in itself was too low according to the undisputed evidence. It made the allowance therefor separately and did not include in its detailed valuation of the physical property any increment on account of the going value, representing the difference between an established plant and business in operation and earning money, and the bare bones of the physical plant. In its final findings of fair value, the Commission not only eliminated any allowance for going value, but reduced the fair value of plaintiff in error's intrastate property as tentatively fixed in its order of January 10, 1931, by making other substantial reductions. The result is that in the alleged fair values as found by the Commission in its orders of January 16, 1934, and March 1, 1934, no allowance whatever has been made for the going concern value in any of the years, either as a separate element or otherwise. The Commission's refusal to value the property as a going concern has deprived

plaintiff in error of its property without due proces of law, and denied to it the equal protection of the laws, in violation of the Fourteenth Amendment to the Constitution of the United States.

"14. The Commission erred in arriving at the fair value of plaintiff in error's intrastate property for each of the years 1925 to 1933, inclusive,

"(a) By excluding from such valuation the following amounts of money invested by plaintiff in error during such respective years in telephone property in process of construction, viz:

1925, $2,161,109; 1926, $4,168,837; 1927, $3,658,921; 1928, $2,059,240; 1929, $2,992,501; 1930, $4,750,748; 1931, $4,874,625; 1932, $810,383; 1933, $2,606,456.

"(b) By disallowing for each of the years 1925 to 1933, inclusive, any amount for engineering in respect to the following items of plant: right of way, buildings and also material values in switchboards installed by Western Electric Company, in other equipment of central offices, private branch exchanges, interior block wires, exchange aerial wire, and toll aerial wire.

"(c) By limiting the allowance for the item of omissions for each of the years 1925 to 1933, inclusive, to one per cent and by excluding the following items of plant from the amount upon which the allowance for omissions was computed: right of way, buildings and general equipment.

"(d) By allowing only one per cent for the item of taxes during construction instead of basing the same on the actual experience of plaintiff in error.

"(e) By allowing an inadequate amount for the item of plant supervision and tool expense.

"The Commission's exclusion of such amounts deprived plaintiff in error of its property without due process of law and denied to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"15. The Commission erred in finding that the actual existing depreciation in plaintiff in error's said intrastate

property as of June 30, 1925, was $14,226,709. The reproduction cost new of plaintiff in error's intrastate property as found by the Commission for the same date in its order of January 16, 1934, was $107,934,197. Based upon such finding of reproduction cost new the Commission should not have found existing depreciation in the property in excess of $10,000,000. The Commission thus erroneously deducted on account of the existing depreciation in plaintiff in error's intrastate property more than $4,000,000 in excess of any sum justified by the evidence. In so doing the said findings and orders of the Commission deprive plaintiff in error of its property without due process of law and deny to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"For each of the succeeding years 1926 to 1933, inclusive, the Commission erred in arriving at the fair value of plaintiff in error's intrastate property by deducting amounts on account of existing depreciation in such property largely in excess of the actual existing depreciation therein.

"16. The Commission erroneously refused to include in plaintiff in error's necessary operating expenses the following sums of money for the years 1925 to 1933, respectively, representing part of the annual expense of depreciation of the intrastate portion of plaintiff in error's depreciable property:

1925	$1,635,563
1926	1,756,299
1927	1,757,275
1928	1,908,000
1929	2,520,223
1930	2,758,913
1931	2,744,479
1932	1,034,985
1933	465,648

"17. The Commission purported to allow in plaintiff in error's operating expenses for each of the years 1925 to 1933 an annual expense of depreciation at the rate of four per cent per annum of plaintiff in error's depreciable

intrastate property, although its actual allowance therefor was less than four per cent. The Commission should have allowed, under the evidence in this case, not less than the following annual amounts for the expense of depreciation in respect of plaintiff in error's intrastate property:

"1925, $4,914,980; 1926, $5,371,921; 1927, $5,815,204; 1928, $6,457,602; 1929, $7,484,033; 1930, $8,247,474; 1931, $8,549,677; 1932, $6,892,986; 1933, $6,269,772.

"The Commission's action in these respects deprives plaintiff in error of its property without due process of law and denies to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"18. Plaintiff in error's annual expense of depreciation was based upon evidence of service life and salvage of the several classes of its depreciable property, which evidence was undisputed. The Commission erred in ignoring such evidence and in fixing arbitrarily what it states was a rate of four per cent per annum, although in fact less than that amount. In doing so, the Commission purported to adopt the retirement theory of depreciation accounting, but in fact based its allowances upon the experience of the company for a period antedating the period in controversy. The Commission's allowance for depreciation expense for the period 1925 to 1931 was $9,852,737 less than actual expense of retirements during that period. Plaintiff in error was entitled for the expense of depreciation to a sum substantially in excess of the expense of its retirements, and the action of the Commission in allowing less than such expense deprived plaintiff in error of its property without due process of law and denied to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"19. The Commission erroneously refused to permit the deduction from plaintiff in error's gross income of the following sums of money for the years 1925 to 1932, respectively, representing sums paid by plaintiff in error to the American Telephone and Telegraph Company on account

of license contract services rendered by said company to plaintiff in error, viz:

"1925, $732,429; 1926, $682,004; 1927, $741,006; 1928, $320,448; 1929, $175,773; 1930, $100,906; 1931, $94,350; 1932, $23,302.

Said sums of money were paid by plaintiff in error to said American Telephone and Telegraph Company for services actually rendered by the latter to plaintiff in error, which services were required by plaintiff in error in the rendition of its intrastate service in the State of Ohio.

"The Commission's refusal to allow plaintiff in error to make such deductions from its gross income or to treat such payments as an operating expense for each of such years deprives plaintiff in error of its property without due process of law and denies to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"20. The Commission erred in failing to make adjustments in plaintiff in error's expenses by way of increases in its Federal Income Tax because of the disallowances shown in paragraphs 16 and 19, *supra*.

"21. The reproduction cost new and the fair value of plaintiff in error's property as of June 30, 1925, as tentatively found and determined by the Commission in said findings and order of January 10, 1931, are less than the actual, true and correct reproduction cost new and fair value thereof and are therefore unjust, unreasonable and too low with respect to said property as a whole and specifically as to each and all of plaintiff in error's classes of property.

"The Commission erred in overruling plaintiff in error's protest against said tentative value order.

"22. The Commission erred in said findings and orders of January 16 and March 1, 1934, in requiring, for the purpose of reducing plaintiff in error's future rates, that plaintiff in error file, effective retroactively as of June 30, 1925, and thereafter until changed by order of the Commission, such schedules of reduced rates for plaintiff in error's in-

trastate service as would produce net income not in excess of the amount found by the Commission to be fair and reasonable as of that date. This requirement of said last mentioned orders plaintiff in error complied with on April 17, 1934, by submitting to the Commission, under protest, 'Rate and Revenue Data and Estimates.'

"Said orders deprive plaintiff in error of its property without due process of law and deny to plaintiff in error the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States, in that:

"(a) The action of the Commission was an attempt to accomplish indirectly that which it could not directly do, viz.: to deprive plaintiff in error of the opportunity to earn a fair return upon the fair value of its property by reducing plaintiff in error's present rates, although they are now producing, as the Commission found in said orders, no more than a fair return on the present value of said property as found by the Commission.

"(b) In said findings and orders of January 16, and March 1, 1934 the Commission found that for the year 1933 plaintiff in error was entitled to earn a return of 5½ per cent upon the fair value of its intrastate property as fixed by the Commission for that year and that plaintiff in error's net income from said property for that year at its present rates did not exceed such a return. Any reduction in plaintiff in error's present rates would necessarily reduce its net income below the amount found by the Commission to be fair, and would be unjust and unreasonable.

"(c) Said hypothetical rates, if now made effective retroactively, will, throughout the period of their effectiveness, deprive plaintiff in error of its property without due process of law and deny it the equal protection of the laws, in violation of the Fourteenth Amendment to the Constitution of the United States.

"(d) Under the applicable Ohio statutes the Commission had no authority to require plaintiff in error to file schedules of rates effective retroactively.

"(e) The action of the Commission in this respect was erroneous and in direct violation of the laws of the State of Ohio, as under such laws the Commission has no authority to fix rates except for the future.

"(f) Such order attempts unlawfully to reduce plaintiff in error's rates for its present and future service, by ordering plaintiff in error to make effective, for such service, rates not in issue in any of the separate bond cases and in respect of which no hearing or proof has been had.

"In addition, the hypothetical rates contained in the 'Rate and Revenue Data and Estimates' which plaintiff in error was compelled to and did furnish to the Commission on April 17, 1934, could not lawfully be made the basis of any order fixing rates for the future for plaintiff in error for each of the following reasons:

"(a) Such hypothetical rates were based on a reduction of $1,822,647 for the year 1925, which reduction was applicable to plaintiff in error's entire intrastate earnings, without distinction as between rates collected pursuant to bond and those not so collected, whereas in the order of September 6, 1934, refunds are ordered only with respect to exchanges and the toll system where rates were collected pursuant to bond and in an amount approximately $450,000 less than the amount of the refunds fixed for the year 1925 by the orders of January 16 and March 1, 1934.

"(b) The hypothetical rates contained in said 'Rate and Revenue Data and Estimates,' if they had been in effect during the years 1926 to 1932, inclusive, would not have produced the reductions in revenue which the Commission found to be proper for said years respectively, either in its said orders of January 16 and March 1, 1934, its order of July 5, 1934, or its order of September 6, 1934.

"(c) Many of the decreases shown in the hypothetical rates in said 'Rate and Revenue Data and Estimates' are with respect to exchanges in which rates were not made effective pursuant to bond. Inasmuch as the Commission in its order of July 5, 1934, and September 6, 1934, required refunds to be made only with respect to rates made effective pursuant to bond, said hypothetical rates could have

no application to the orders of the Commission as now modified.

"(d) The Commission had no right to fix rates for plaintiff in error's intrastate telephone service for the present and future by considering only the fair value of the property, the revenues, expenses and net income of plaintiff in error for the year 1925. In determining rates for the present and future the Commission was required to consider the fair value of plaintiff in error's property, its revenues, expenses and net income for the most recent period available. Although the Commission, in determining the refunds to be ordered, found even on the low value of plaintiff in error's intrastate property as fixed by the Commission for the year 1933, and upon the Commission's own findings in respect of revenues, expenses and net income for that year, that plaintiff in error was earning only a barely compensatory return for that year and therefore upon such finding made no order of refund against plaintiff in error for the year 1933, nevertheless, the Commission has refused to consider and give effect to the same evidence, in respect of plaintiff in error's present and future rates.

"23. The Commission erred in its findings and orders in failing to continue the existing rates of plaintiff in error in effect for the present and future and in overruling the written requests of plaintiff in error so to do filed in this cause on February 17, July 31 and August 29, 1934.

"Plaintiff in error showed the Commission that if permitted it would prove that if either of the revisions of rates proposed by the Commission should be made effective the result would be to reduce plaintiff in error's net income from its intrastate business in Ohio for the year 1934 by more than $1,800,000 and to permit it to earn less than 3½% for the year 1934 on the present fair value of its property employed in its intrastate service in Ohio. The Commission found that for the year 1933, plaintiff in error had earned only a barely compensatory return.

"It was the duty of the Commission under the evidence in this cause and its own findings to determine that the

existing rates of plaintiff in error were no more than just and lawful rates to be charged for the present and future until modified in accordance with law, but if the Commission proposed to make any reduction in the existing rates, plaintiff in error was entitled to a hearing and the right to introduce evidence as to the fair value of its property, its revenues, expenses, net income and fair rate of return for the year 1934, and thereby to prove that any such reduction would be unlawful and unreasonable.

"The action of the Commission is denying plaintiff in error's request and in requiring it to render future services in Ohio at admittedly confiscatory rates has deprived plaintiff in error of its property without due process of law and denied to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"24. The Commission erred in overruling, denying and in failing to comply with plaintiff in error's several applications and requests filed on February 17, July 31, August 29, and September 25, 1934, asking: (1) that the Commission modify said findings and order of January 16, 1934, by finding, deciding and ordering the rates then and now charged by plaintiff in error for its services rendered in the State of Ohio to be no more than just and lawful rates and by fixing and establishing such rates as the rates hereafter to be charged and collected by plaintiff in error for its services until changed or modified in accordance with law; (2) that the Commission permit plaintiff in error in accordance with the requests theretofore made by it and thereby renewed to introduce evidence of the fair value of its property, its revenues and expenses and net income in each of said separate cases where plaintiff in error was and is collecting rates pursuant to bonds; and (3) that the Commission afford plaintiff in error an opportunity to examine, analyze, explain and rebut the price trend information considered by the Commission in arriving at said findings and order of January 16, 1934, and the Commission's method of applying the same, which information was at no time exhibited to plaintiff in error or in-

troduced in any open hearing or made a part of the record in said cause, and to which information plaintiff in error had never had access and as to which method it has never been informed.

"The action of the Commission in so denying said applications and requests has deprived plaintiff in error of its property without due process of law and has denied to it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"25. The Commission erred in requiring plaintiff in error to repay unstated portions of its intrastate toll rates collected under bond 'to the persons, subscribers and patrons paying the same, notwithstanding payments for said services were made by such persons and patrons to telephone companies other than The Ohio Bell Telephone Company because of the interchange of telephone service.' Plaintiff in error cannot lawfully be required under the terms of the applicable Ohio statutes and the conditions of the bonds executed by it to make any refunds except to persons who are its subscribers or patrons.

"26. Plaintiff in error has been denied a fair trial and hearing in respect of the fair value of its property; it has been denied a fair trial and hearing in respect of whether the rates put into effect under bond in its several exchanges and its toll system were excessive and unreasonable in each separate case in which such rates were made effective pursuant to bond and it has been denied any trial with respect to the just and reasonable rates for its present and future service. Such denials have resulted in depriving plaintiff in error of its property without due process of law and denying it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"27. The Commission erred in its order of September 6, 1934 in requiring the repayment by plaintiff in error to its intrastate toll users of the sum of $232,282 for the year 1925 and the sum of $176,845 for the year 1926 without having made a determination of the fair value of plaintiff in error's property and its revenues, expenses and net income

in such intrastate toll system. There was no evidence upon which the Commission could have based any finding that plaintiff in error had, in any year, made any excessive earnings in its toll system.

"Plaintiff in error demanded the right to prove the fair value of its property used in rendering its intrastate toll service and to show the net income from such property. The Commission refused to receive such evidence. Therefore, it could make no valid order requiring any refunds to be made by respondent on account of toll rates collected under bond and the Commission's orders in this respect deprive plaintiff in error of its property without due process of law and deny it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"28. The Commission erred in its order of September 6, 1934 in the following respects and each thereof:

"(a) It denied the protest and application and petition of the plaintiff in error asking, for the reasons and upon the grounds set forth therein a rehearing with respect to the matters and things decided and determined by the finding and order made and entered herein upon July 5, 1934;

"(b) In finding, as set forth in said order of September 6, 1934, that it had accorded plaintiff in error ample opportunity to examine and consider all necessary and pertinent information requested in plaintiff in error's application and request directed to the Commission's order of July 5, 1934, and in overruling said application and request;

"(c) In overruling the verified return of plaintiff in error to the rule to show cause contained in the Commission's findings and order of July 5, 1934 and the prayer thereof;

"(d) In ordering that all protests and objections to the Commission's finding of July 5, 1934, filed and made by plaintiff in error, inconsistent with the order of September 6, 1934, be overruled.

"29. The Commission further erred in overruling on October 19, 1934, (a) the protest, application and petition of plaintiff in error for a rehearing filed on October 1, 1934, and (b) its said application for a stay, postponement and suspension of the enforcement of the orders of the Public Utilities Commission of Ohio in so far as they order and direct plaintiff in error to make the repayments and refunds ordered by the Commission.

"In each and all of the foregoing respects complained of, and in denying plaintiff in error's protests, applications and petitions for rehearing, the said proceedings, acts, findings and orders of the Commission and each and all thereof affect materially the substantial rights of plaintiff in error, are erroneous and prejudicial to it and are unlawful, unreasonable and are not supported by evidence, are against the weight of the evidence and contrary to the evidence and the law and in violation of the applicable Ohio Statutes and of Article 1, Section 1 of the Constitution of the State of Ohio, and, further, are confiscatory and will, if enforced, result in the confiscation of plaintiff in error's property and deprive it of its property without due process of law and deny to plaintiff in error the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

"Each and all of the foregoing grounds and specifications of error were urged and relied upon by plaintiff in error in said protests, applications and petitions for a rehearing filed by it in cause No. 3307 on the docket of the Commission.

"WHEREFORE, plaintiff in error prays that said findings and orders of defendant in error, the Public Utilities Commission of Ohio, made and entered in said cause No. 3307 on September 6, as well as the orders of January 16, March 1, July 5 and July 9, 1934, in so far as said findings and orders form the basis for or are incorporated into the findings and order of September 6, 1934, and each of them, be reversed, vacated and set aside by this Court as unlawful and unreasonable and that plaintiff in error may be restored to all things lost by reason thereof."

The various findings and orders made by the commission and the procedural steps taken by the company are brought in to the record through exhibits "A" to "U" inclusive. These exhibits are too voluminous to carry into this statement and we are content to set out a list of same, with designating letter.

"A" Tentative Finding of January 10, 1931.

"B" Order of January 10, 1931, fixing value.

"C" Protest of the Ohio Bell Telephone Company to value fixed in order of January 10, 1931.

"D" Findings of January 16, 1934.

"E" Order of January 16, 1934.

"F" Application for Rehearing of January 16, 1934, order.

"G" Application and Request of the Ohio Bell Telephone Company of February 17, 1934.

"H" Order of March 1, 1934.

"I" Application for Rehearing of March 1, 1934, order.

"J" Order of July 5, 1934.

"K" Order of July 9, 1934.

"L" Application and Request of the Ohio Bell Telephone Company of July 31, 1934, with respect to the order of July 5, 1934.

"M" Application and Request of the Ohio Bell Telephone Company with respect to the order of July 9, 1934.

"N" Verified Return to the order to show cause contained in the order of July 5, 1934.

"O" Verified Return to the order to show cause contained in the order of July 9, 1934.

"P" Protest and Application for Rehearing of July 5 and July 9, 1934, orders.

"Q" Protest and Application for Rehearing filed August 29, 1934.

"R" Order of September 6, 1934.

"S" Application and Request of the Ohio Bell Telephone Company of September 6, 1934.

"T" Protest and Application for Rehearing of September 25, 1934, with respect to the order of September 6, 1934.

"U" Application to the Commission for a stay.

The commission took judicial notice of the trend of prices during the years involved in this proceeding and for the purposes of its determination and finding referred to and considered a periodical publication known as The Engineering News Record, and the company avers used other sources of information to it unknown; also, considered prices of materials furnished by manufacturers of telephone equipment and land values as ascertained from tax valuations, all of which it is claimed was erroneous. That on February 17, July 31, and September 25, 1934, the company filed written requests with the commission asking it to disclose the evidence upon which it arrived at price trends, all of which was refused.

With the mechanics governing the proper distribution of the refunder herein, this court at this time has nothing to do.

This fact is in dispute.

The petition in error and the exhibits make up the entire record of the case. For the means used and the methods followed by the commission in determining the rate base and rate of income, reference must be had to the petition in error, exhibits and briefs of counsel.

Mr. Karl E. Burr, Mr. W. H. Thompson, Mr. W. B. Stewart and *Mr. Ashley M. Van Duser,* for plaintiff in error.

Mr. John W. Bricker, attorney general, and *Mr. Donald C. Power,* for defendant in error.

By the Court.

Valuation Including Price Trends.

As of the date certain of June 30, 1925, the commission fixed the tentative valuation of the company's property at $104,282,735. Subsequently this was reduced $10,575,247. Item by item the company complains about the commission's figures such as those relating to right of way, land, buildings, central office equipment, distributing system, undistributed construction costs, going concern value and construction work in progress. However, a laborious study of the super-abundant record of approximately 70,000 pages dis-

closes a sharp conflict of competent evidence on every point, and under such circumstances this court cannot properly hold that the findings of the commission are against the weight of the evidence. Illustrative of this fact is the matter of intangible, undistributed construction expenditures. One witness expressed the opinion that the allowance for this item should be approximately $19,088,000; another that it should be $18,525,000; another that it should be $16,000,000; and still another that it should be $12,000,000. The commission after hearing and seeing the witnesses allowed $12,650,143. Certainly this court is at least in no better position to appraise the value of this conflicting testimony.

It is contended that there was failure to consider certain vital elements in determining questions of valuation. For instance, the claim is made that the commission excluded from the property value money necessarily invested in construction work which was in progress in an average annual amount of $3,000,000 for the nine-year period.

The commission held that no allowance could be included for this work in determining value for rate-making purposes, because the property was not complete and ready for service and therefore not used and useful property in the service of the public within the meaning of Sections 499-8, 499-9, 614-20 and 614-23, General Code. An allowance was made, however, for the item of interest during construction, which fully and adequately compensated the company for the use of its capital which was invested in unfinished construction work, and the amount of allowance so made entered into the rate base which was fixed by the commission. Furthermore, allowance was made for capital so invested as soon as the new construction came into use, and provision was also made for the capitalization of materials used in construction and inventories on hand before they were used in the process of construction.

It is also contended that no consideration was given to the cost of property and the cost of reproduction of property. It may be conceded that such costs are relevant facts to be considered in determining values. *Los Angeles Gas & Electric Corp. v. Ry. Comm. of California*, 289 U. S. 287, 306, 77 L. Ed., 1180, 53 S. Ct., 637.

In support of its contention that cost of property was ignored, the company offered a table which purports to show cost of the company's intrastate property aside from construction work in progress, and similar facts. But there is nothing in the record to show that the evidence so offered was not considered, along with the other evidence in the case relating to cost, in determining the rate basis.

As to the claim that the commission did not consider cost of reproducing property, the record discloses that evidence was adduced relating thereto and there is entire absence of a showing anywhere in the record that the commission failed to give proper consideration to such evidence bearing upon the question of expense of reproducing essential property.

A careful consideration of all claims of the company relating to alleged omissions or failure to consider certain elements of value discloses that the contentions are not borne out by the record. In fact, it appears that the commission determined its rate base from all the evidence before it, including that relating to these alleged ignored items, and thus reached the conclusion it did relative to the basic valuation fixed for determining a fair and reasonable rate.

Likewise the company strenuously complains because, although neither side introduced evidence of price trends, the commission took judicial notice of such trends; but even a casual examination of the decisions of the United States Supreme Court unquestionably discloses definite and repeated sanction of this principle.

In the case of *Central Kentucky Natural Gas Co. v. Railroad Commission of Kentucky*, 290 U. S., 264, 78 L. Ed., 307, 54 S. Ct., 154, Mr. Justice Stone stated that one ground for reversal of the judgment of the lower court was its exclusion "from consideration the profound changes in values, costs of service, consumption of commodities and reasonable return on invested capital which we judicially know took place during the period of more than five years while the case was pending before the Commission and the Court." Then in the ninth paragraph of the headnotes of

that case, as reported in 78 L. Ed., appears the statement that "judicial notice may be taken of changes in values, cost of service, consumption of commodities and reasonable return on invested capital which have taken place during the period while a case was pending before the Utilities Commission and the Court."

In the later case of *Dayton Power & Light Co. v. Public Utilities Commission of Ohio*, 292 U. S., 290, 78 L. Ed., 1267, 54 S. Ct., 647, Mr. Justice Cardozo said that "in view of business conditions, of which we take judicial notice, • • • the rate allowed was adequate." Then in the twenty-fourth paragraph of the headnotes of that case in 78 L. Ed., it is stated that "the Supreme Court of the United States takes judicial notice of business conditions."

In the *Dayton case, supra*, Mr. Justice Cardozo cites the case of *Atchison, Topeka & Santa Fe Ry. Co. v. United States*, 284 U. S., 248, 76 L. Ed., 273, 52 S. Ct., 146, in which Mr. Chief Justice Hughes said that "There can be no question as to the change in conditions upon which the new hearing was asked. Of that change we may take judicial notice." Then in the second paragraph of the headnotes of the case in 76 L. Ed., appears the statement that "the Court may take judicial notice of a general economic depression."

In view of these authorities it is readily apparent that the commission committed no error in this respect.

Operating Expenses.

In the matter of operating expenses, the commission apparently accepted and applied the testimony of the company in the consideration and determination of most of the items involved. That was true as to the very important item covering cost of current maintenance, including salaries, in which there was no reduction whatever from the claims of the company.

We shall refer particularly to the amount urged by the company for allowance for license contract services. These charges were seriously challenged by the commission. They have reference to certain services furnished the Ohio Bell Telephone Company by the American Telephone &

Telegraph Company and other associated companies, compensation for which was computed at a stated per cent of the gross revenues.

Such license contract provides that the licensee was to receive from the licensor in addition to all other services and benefits accruing to the licensee, the described services and privileges which have been briefly summarized as follows: (a) The right to use all telephonic devices covered by patents owned by the licensor and all new improved apparatus in the art of telephony resulting from experimental work under the direction of the licensor, and protection against all suits for infringement. (b) The continuous prosecution by the licensor of research work in the development of the art and the plans designed to promote economy and efficiency in equipment of the plant of the associated companies. (c) Advice in engineering, traffic, operating, commercial, accounting, patents, legal, administrative and other matters pertaining to the successful conduct of the telephone business. (d) Advice and assistance in any financing required to be done by the licensee in the extension of its plant or improvement to its system, and assistance in marketing licensee securities and other necessary financial support. (e) The right to extend to subscribers of the licensee the connections provided between its system and the system of other associated companies and their subscribers. (f) Active assistance in connection with such measures as will best protect the health of employees and in other ways conserve the high quality of service and maintenance by the licensor of various pension and insurance plans. (g) The right of the licensee to extend to its connecting companies the benefit of the advice and information that the licensee may receive from the licensor.

In order that the services may be promptly performed the licensor was to (a) Render available for use of the Bell Company all products of the licensor's research and all inventions, etc., relating to the art of telephony, which, after investigation, are pronounced by the technical experts of the licensor to be of practical use. (b) Maintain continuously an organization of specialists to relieve the licensee from the necessity of performing such work. (c) Maintain facili-

ties for connection between the system of the licensee and the system of other associated companies.

The contract provides for full service between the exchange of the licensee and the toll lines of the licensor setting out provisions for payment of interline service.

The company classifies the costs for services claimed to have been rendered, but which were rejected in whole or in part by the commission, in the following departments: Development and research; information; personnel; public relations; treasurer's; comptroller's; secretary's; administration and general service; operations; depreciation of telephone instruments; contingent liability for patent infringement.

The commission was of the opinion that valuable service was rendered the Ohio Bell Telephone Company by the American Telephone & Telegraph Company, which concededly is the parent corporation, and that a substantial portion of the payments claimed to have been made to defray the costs of the parent company in providing such service should be, and they were, accordingly, allowed. It found, however, that a portion of the payments so claimed resulted in no benefit to the Ohio Bell Telephone Company and should not be included as a part of its operating expenses. In view of the uncertain and indefinite character of the proof based in great measure upon estimate and opinion, if not conjecture, it cannot be said that the findings and conclusions of the commission were unfair or unreasonable, and certainly there is no basis for finding that they were unlawful.

The commission followed the admonition of the Supreme Court of the United States in the Illinois proceeding reported in *Smith et al., Commerce Comm., v. Illinois Bell Telephone Co.*, 282 U. S., 133, 75 L. Ed., 255, 51 S. Ct., 65, and *Lindheimer et al., Commerce Comm., v. Illinois Bell Telephone Co.*, 292 U. S., 151, 78 L. Ed., 1182, 54 S. Ct., 658, and endeavored to ascertain the cost to the American Telephone & Telegraph Company of the service furnished by it to the Ohio Bell Telephone Company. It did not and was not bound to accept fully and unconditionally the statements of the company as to the amount claimed to have

been paid to the parent company; nor was it concluded thereby as to the reasonableness or propriety of such service; nor bound to regard the amount paid as the true value of such service to the Ohio Bell Telephone Company. Just as in other respects, its findings and conclusions upon these items will not be disturbed unless shown to be manifestly against the weight of the evidence or in contravention of law.

For instance, the commission allowed the claim for engineering service in its entirety. On the other hand, it denied in its entirety the claim made for services rendered in its information department, it having found that the general advertising of the American company, national in scope, did not relate to the Ohio Bell Company as such, and that such general advertising should not be paid by the Ohio telephone users.

The commission found that the department of development and research did much for the benefit of the associated companies. It rejected some of the costs and expenses claimed because not related to Ohio Bell telephone operations. These charges were for television, radio, submarine, cable and other similar items.

In the so-called personnel department, many items of cost were allowed as claimed, those disallowed having been found rather in the interest of the holding company than of the licensee and hence not proper charges against the rate payer of the operating company.

So also as to the public relations department, the commission found that no part of such cost should be considered in determining the rate to be paid by the Ohio telephone user for the same reason.

The partial disallowance of the charges made for the treasurer's and comptroller's departments, and the total disallowance of the charges of the secretary's department and the department of operations, were likewise based upon its finding that those services were solely for the benefit of the parent company. The so-called general service bureau is referred to as a coordinating department in which general administration costs were included. It seems to be a

sort of catch-all for items that might possibly have been omitted from some classification. The allocation was uncertain and unsatisfactory. The commission was probably about right when it allowed half of the amount claimed. The same may be said of its allowance for depreciation of telephone instruments.

It does not appear how there could be justification for a specific allowance for contingent liability for patent infringements, for it does not appear that there has been any actual cost to the American company in the way of loss or damage because of patent infringements of apparatus used by the Ohio Bell Telephone Company, and the mere possibility is too remote and speculative to warrant a charge against the telephone user. So the commission found, and their finding seems commendable.

We deem it unnecessary to discuss in detail each of these specific claims of expenditure for service rendered by the parent company. Suffice to say that from an examination thereof we are of the opinion that the conclusions reached by the commission were just and the allowances made fair and reasonable, and hence should not be disturbed.

The item, expense of depreciation, was recognized by the commission as a legitimate part of the operating costs. The elements of maintenance and of essential replacements were regarded as factors, and it was conceded that the telephone user must, as part of his rate, provide funds to meet the wear and tear upon the physical plant resulting from the year's operations, and such expense entered into the calculations of the commission, as disclosed by its detailed findings. Its findings and conclusions thereon were apparently reached after careful consideration of the volume of testimony introduced and record evidence placed before it, and we find no warrant for their disapproval.

Depreciation.

The commission makes the unchallenged statement in its brief that "With the exception of the amounts claimed by the company for the expense of depreciation, license contract costs and Western Electric purchases chargeable

to expense, the commission allowed without question all of the operating expenses contended for by the company."

There are two sections of the General Code of Ohio expressly dealing with the subject of "depreciation" in relation to public utilities.

Section 614-49, General Code, provides: "Every public utility shall carry a proper and adequate depreciation or deferred maintenance account, whenever the commission after investigation shall determine that a depreciation account can be reasonably required. The commission shall ascertain, determine and prescribe what are proper and adequate charges for depreciation of the several classes of property for each public utility. The charge for depreciation shall be such as will provide the amount required over and above the cost and expense of maintenance to keep the property of the public utility in a state of efficiency corresponding to the progress of the art or industry. The commission may prescribe such changes in such charges for depreciation from time to time as it may find necessary."

It is further provided, in Section 614-50, General Code, that "The moneys for depreciation charges thus provided for shall be set aside out of the earnings and carried as a depreciation fund. The moneys in such fund may be expended in new construction, extensions or additions to the property of the public utility, or invested, and if invested the income from the investment shall also be carried in the depreciation fund. Such fund and the proceeds thereof, may be used for the purpose of renewing, restoring, replacing or substituting depreciated property in order to keep the plant in a state of efficiency. Such fund and the proceeds or income therefrom shall be used for no purpose other than as provided in this section, except upon the approval of the commission."

In the case of *Lindheimer v. Illinois Bell Telephone Co., supra,* Mr. Chief Justice Hughes succinctly defines "depreciation" as "the loss, not restored by current maintenance, which is due to all the factors causing the ultimate retirement of the property. These factors embrace wear and tear, decay, inadequacy, and obsolescence."

Upon the merger or consolidation of September 21, 1921, the company began business with property having a book value of $77,839,932 and a depreciable value of $69,070,160. Several additional properties of considerably smaller valuation were acquired afterwards. With perhaps one exception they were taken over at net cost, with no reserve for accrued depreciation or amortization.

The commission found that from the date of merger the company pursued the policy of keeping its property in good condition and in a high state of efficiency, expending for current maintenance and repairs from the time of merger to the date certain, viz., June 30, 1925, the sum of $16,385,139, and from the date certain to December 31, 1931, the further sum of $42,064,639, which the commission denoted as liberal.

While expending the sums mentioned for current maintenance and repairs, the company's net charges to reserve for depreciation from the date of merger to the date certain were $11,349,664, and from the date certain to December 31, 1931, amounted to $40,956,301.

As is pointed out in the *Lindheimer* case, *supra*, it is extremely difficult as a practical matter to draw a definite line between funds accredited to current maintenance and repairs and those allocated to depreciation. It stands to reason that when proportionately large amounts are expended in maintaining the plant of a public utility in a high state of efficiency and good condition, the amount necessary for depreciation expense should be correspondingly less. *Pioneer Telephone & Telegraph Co. v. State*, 64 Okla. 304, 167 P., 995, L. R. A., 1918C, 138.

In view of our future remarks on the subject of depreciation as it pertains to this case, it would now seem appropriate to call attention to certain pronouncements of the Supreme Court of the United States in the *Lindheimer* case, *supra*. It was there said in substance that where a public utility complains that rates ordered by a regulatory body are confiscatory, the utility "has the burden of making a convincing showing that the amounts it has charged to operating expenses for depreciation have not been excessive," and that since charges to depreciation

should be representative of the expense occasioned to the public utility by the using of physical property employed as fixed capital, excessive charges for such object have the wrongful and indefensible effect of requiring patrons to provide capital contributions, not to make good losses incurred by the utility in the service rendered and thus keep its investment unimpaired, but to secure additional plant and equipment upon which the utility expects a return.

Since in the instant case the amounts charged to depreciation were included in the rates imposed against the company's subscribers, the commission felt obligated to investigate the matter of depreciation from the date of merger through the year 1933, to arrive at a fair and just result.

There can be little argument that when the consolidation of 1921 occurred, and upon the acquisition of additional properties, the company should have provided from capital contributions or charged to surplus the amount necessary to replace worn out, obsolete and useless units.

From evidence presented the commission found that at the date of merger the company's property was actually in a per cent condition approximating 83 per cent, which required a depreciation reserve of $14,638,870, but that with depreciable fixed capital of $69,049,424, a depreciation reserve of only $6,219,829 was supplied, according the property an erroneous per cent condition of about 91 per cent.

While admittedly the company made extensive replacements and improvements between 1921 and 1925, with an annual increase in depreciation reserve, the per cent condition, according to the company's records, steadily declined, reaching a low of 87.51 per cent on the date certain.

Obviously, this presented an extraordinary situation and suggested to the commission that the charges to depreciation reserve during the initial years of the company's existence were in excess of the inadequate amount furnished for depreciation at the date of merger, and that in order to sustain a credit balance in the depreciation reserve to make good the original deficiency, the company included excessive amounts for depreciation in its charges to current

operating expenses, which were reflected in the rates to subscribers.

In support of this conclusion, the commission engaged in an elaborate set of calculations covering the period from September 21, 1921, through 1933, included in its brief in tabulated form.

This table purports to show that from September 21, 1921, through the year 1924 the company retired its original depreciable plant to the extent of a net realized depreciation of $8,479,728, which indicated too much retirement in too short a time, in light of the erroneous 91 per cent condition accorded the depreciable property by virtue of the insufficient depreciation reserve set up in the beginning.

Upon computations extending through 1933 the commission found that the total charges against the reserve for depreciation were $59,339,088, of which $38,270,252 was covered by the additions to the reserve since September 21, 1921, $6,219,829 was covered by the reserve in existence as of September 21, 1921, and $14,849,007 was representative of the amount of realized depreciation in excess of the credits which had been made to the depreciation reserve on the assets replaced.

Under a maze of figures, the continuation of which would but lend to confusion, the commission contended that the company should have begun operations with additional reserve for depreciation of $14,849,007, or that this amount should have been charged to surplus.

On the basis of "per cent condition," the commission determined that the company's initial reserve for depreciation should have been $14,638,870, instead of $6,219,829. Such discrepancy resulted in the elimination of the difference, viz., $8,419,041, as charges against the depreciation reserve, representing as it did losses antedating the merger, and which the company had charged to operating costs thereafter, at the expense of its subscribers.

Thus, the commission was unable to escape the conclusion that the company had commenced business with a grossly inadequate depreciation reserve, and that this deficiency together with appreciable replacements and changes made necessary by consolidation, which should

have been contributed by capital or taken from surplus were financed by abnormal depreciation charges and corresponding credits to the depreciation reserve during twelve and one-quarter years of the company's existence, and especially up to and including the year 1931.

Substantiating its findings that the company from its beginning had created an excessive reserve for depreciation to absorb the amount which should have been furnished at the start, the commission points out in its brief that from 1922 through 1931 the company's composite depreciation rate ranged from 5.68 per cent to 5.92 per cent, but that it was voluntarily reduced in 1932 to 4.50 per cent, and to 4.18 per cent in 1933, thus tending to show final absorption of the deficiency in the depreciation reserve during the year 1931.

After digesting the mass of evidence presented to it on the question of depreciation, the ultimate function of the commission was to fix a composite rate to be applied annually from the year 1925 to maintain a proper depreciation reserve.

It is to be remembered that the commission did not challenge the charges of the company for maintenance and repairs, which were generous, or any depreciation expense except the major item relating to telephone plant and equipment. Neither did it disturb the depreciation expense charged between September 21, 1921, and the year 1925, which was found to be excessive. The future was its concern in the light of what had transpired in the past.

Proceeding to fix the annual composite rate for depreciation expense, effective from 1925, the commission found that from the date of merger to the date certain the company annually charged as depreciation expense an average composite rate of 5.50 per cent, and that its net charges to reserve for depreciation during the same time were equal to an annual composite rate of 3.74 per cent.

Taking into consideration the substantial sums spent by the company in the years preceding and following the date certain for maintenance and repairs, and that the depreciable property of the company was in a good, improved and up-to-date condition as of June 30, 1925, the commis-

sion decided that a composite rate of 4 per cent was just and fair to provide for annual statutory depreciation, and that it should be applied from 1925 forward.

It appears in the case of *Michigan Public Utilities Commission v. Michigan State Telephone Co.*, 228 Mich., 658, 200 N. W., 749, that the commission had fixed a rate of depreciation at four per cent of the total fair value of the company's depreciable property. The Supreme Court of Michigan in upholding such action said:

"Probably in a majority of the cases a higher rate has been sustained. But this is a question of fact depending largely upon the character, nature and age of the property in question, and illuminated somewhat by the experience of the company respecting the subject. And it must not be overlooked that, as the cases show, many minor replacements, and repairs and maintenance are made and charged to operating expense. In practice, this contributes considerably toward keeping the property intact. The commission in its opinion * * * reviews the question at length, and states fully the experience of the company respecting the rate of depreciation and the accumulation of the fund. The rate fixed is comparatively low, but, in the light of the facts of this case, we must decline to hold it confiscatory."

As authority for the proposition that the past experience of a public utility affords a tenable foundation upon which to establish the rate that should be allowed in the future for annual depreciation, the commission relied on the case of *Smith v. Illinois Bell Telephone Co., supra.*

The value of the company's depreciable property having been fixed at $84,330,894 as of the date certain, the amount allowed for depreciation expense for the year 1925 at 4 per cent was $3,373,236. The commission further prescribed that depreciation expense for subsequent years should be based on the determined value of the depreciable property at the date certain plus net additions thereto. Consequently, from the years 1925 to 1933, inclusive, the depreciation allowance to the company under the commission's order amounted to $45,266,614, being some $17,267,353 less than claimed by the company upon higher con-

posite rates and higher valuation, which it contends are reasonable.'

Naturally, the company registers vigorous protest to the methods pursued by the commission, arguing that it had no right to rest its calculations on the period preceding the date certain, disregarding the actual retirement losses of the company during the time for which refunds were ordered. The company earnestly maintains that its actual realized retirement losses from 1925 to 1933, inclusive, were $8,364,256, and that its true expense of depreciation during such time was some $16,000,000, which no one disputes, and that they have been entirely ignored through the erroneous course adopted by the commission; to which the commission replies that if the company had commenced business with a proper depreciation reserve of $14,638,870 instead of $6,219,829, and if certain properties acquired since September 21, 1921, had had reasonable depreciation reserves, the company would have had an ample reserve on December 31, 1933, of $14,652,468.

The conflict between the company and the commission is apparent. The former insists that computations should be confined to the period between 1925 and 1933, while the latter has seen fit to extend its inquiry to the beginning of the company's existence.

"Depreciation" is inherently a complex subject. It becomes more so when the particular enterprise under consideration is of great magnitude and millions of dollars are involved. In weighing and dissecting the evidence, a knowledge of law plays a minor part. One attempting a comprehensive grasp of the intricacies presented should be both a skilled engineer and a competent accountant, versed in the problems peculiar to the public utilities field.

We have made a conscientious examination of the voluminous evidence relating to "depreciation" and have analyzed it to the best of our ability with regard to the conflicting contentions of the adverse parties. There being substantial support for the findings and order of the commission on this feature of the case, they will be permitted to stand.

RATE OF RETURN.

The company complains that the rate of return allowed by the commission is inadequate and confiscatory. The rates of return allowed by the commission are as follows: 7 per cent for the years 1925 to 1929, inclusive; 6½ per cent for each of the years 1930 and 1931; and 5½ per cent for each of the years 1932 and 1933. These rates they find and declare were ample in the light of the economic conditions existing during the periods involved. A rather recent case dealing with this question is that of *Illinois Bell Telephone Co. v. Gilbert*, 3 F. Supp., 595, in which there is a discussion of the question quite timely and appropriate to the case before us. From that case we quote the following:

"A public utility enjoying the advantages of plaintiff is not entitled to the large earnings made by many undertakings during periods of great prosperity. On the other hand, its return in times of business adversity should not be reduced to the extent that the earnings of many private corporations have been impaired. The range of from 7½ per cent to 5½ per cent as found in this case gives weight, in our opinion, to all of the elements which under the ruling of the Supreme Court we are required to consider."

The court took judicial notice of the general decline in corporate earnings during the years 1931 and 1932 and said: "It is for this reason that we have fixed 6½ per cent as the proper rate of return for 1931 and 5½ per cent as the proper rate of return for 1932."

In *Dayton P. & L. Co. v. Public Utilities Commission, supra*, the Supreme Court of the United States, on page 311, in approving as adequate a rate of return of 6½ per cent, said: "In view of business conditions, of which we take judicial notice (*Atchison, Topeka & Santa Fe Ry. Co. v. United States*, 284 U. S., 248, 260), the rate allowed was adequate."

A rate of return deemed reasonable under generally prevailing normal economic conditions may be excessive in a period of economic depression, and a rate of return deemed reasonable in a period of depression may be wholly inadequate and confiscatory in a period of general pros-

perity. That a general economic depression prevailed during the years here considered requires no proof, and this court will, even as the Supreme Court of the United States did (*supra*), take judicial notice of that fact. The fact that the prevailing economic depression is reflected in a reduction in the rate of the return allowed to a utility does not necessarily render the rate of of return allowed confiscatory where the reduction made is reasonable in the light of prevailing conditions.

Another recent case in point, decided in February, 1925, is *Chesapeake & Potomac Telephone Co. v. Whitman*, 3 F. (2d), 938, wherein the court approved a 6 per cent return on the value of the telephone company property, and held that since the telephone company was an integral part of a nation-wide system and was assisted in its financing by the corporation controlling it, the rate of return allowed was not confiscatory. The court, on page 954, said: "• • • If the present company stood alone, either in the sense that it had, unaided, to look after its own financing, or that it did not form what is in reality an integral part of a nation-wide system we might well doubt whether a return of 6 per cent would be sufficient to enable it to raise the money necessary to its growth, and therefore, it may be, to its life; but such is not the case. It is owned and altogether controlled by the American Telephone & Telegraph Company, hereinafter styled the National company. In partial return for a substantial annual sum paid by it to the National company, the latter has agreed to assist it in its financing. • • • All that we hold is that, if the company be allowed as much as 6 per cent, its property has not been confiscated. • • •"

In the instant case, the commission, in its opinion, finds that the company "enjoys a virtual monopoly in the territory in which it operates; its business constitutes one of the most substantial and profitable utility businesses in the state; its properties are favorably located in serving many of the large and thriving communities of Ohio; its management is of a high grade of efficiency; its financial position, because of its subsidiary character, is of a very high order, and it has been able by reason thereof to secure funds for

its additions and betterments without going into the open market for money and there is no indication that it will be required to enter the public market for finances in the immediate future. It may be said the element of risk to the investor as applied to this company is negligible."

In *Smith v. Illinois Bell Telephone Co., supra*, the court, on pages 160, 161, said: "• • • In determining what is a confiscatory regulation of rates, it is necessary to consider the actual effect of the rates imposed in the light of the utility's situation, its requirements and opportunities. As was said in *United Railways v. West*, 280 U. S. 234, 249, 250 [74 L. Ed. 390, 408, 50 S. Ct. 123], a rule as to the rate of return can not be laid down which would apply uniformly to all sorts of utilities; 'what may be a fair return for one may be inadequate for another, depending upon circumstances, locality and risk.' In that case the court restated the general rule in the language of the opinion in *Bluefield* [*Water Works & Improvement Co.*] *v. Public Service Commission*, 262 U. S. 679, 692, 693 [67 L. Ed. 1176, 1182, 1183, 43 S. Ct. 675], as follows: 'What annual rate will constitute just compensation depends upon many circumstances and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.'

"It is evident that in the present case we are not dealing with an ordinary public utility company, but with one that is part of a large system organized for the purpose

of maintaining the credit of the constituent companies and securing their efficient and economical management."

In the case of *Wabash Valley Electric Co. v. Young*, 287 U. S., 488, 77 L. Ed., 447, 53 S. Ct., 234, the court held that a rate of return of 7 per cent for a public utility company supplying electricity would not be deemed so inadequate as to amount to a taking of property without due process because after taking care of debts and dividends there might be nothing left for surplus, where it appeared that the company had a surplus equal to nearly 28 per cent of its total stock and funded debt liability, and the fact that it was a subsidiary of a company by which its stock and securities were owned, and which also owned and financed other similar companies, made it reasonable to conclude that it was in a more favorable financial situation than if it were a disconnected enterprise.

From a consideration of these authoritative decisions, it must be concluded that the rate of return allowed by the commission is fair and just and hence should not be disturbed.

Upon the entire record we are of opinion that the findings and conclusion of the Public Utilities Commission of the state are neither unlawful nor unreasonable. Its order is therefore in all respects affirmed.

Order affirmed.

WEYGANDT, *C.J.*, STEPHENSON, WILLIAMS, MATTHIAS, DAY and ZIMMERMAN, *JJ.*, concur.

JONES, *J.*, not participating.

APPENDIX B.

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO.

No. 3307.

In re Investigation and inquiry of The Public Utilities Commission of Ohio, upon its own motion, for the determination (a) of the fair value of the property of The Ohio Bell Telephone Company, toll and exchange (b) of the just and reasonable rates and (c) of reasonable rules and regulations for services furnished by said company to its patrons throughout the State of Ohio.

OPINION AND FINDING.

January 16, 1934.

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO.

No. 3307.

In re: Investigation and inquiry of The Public Utilities Commission of Ohio, upon its own motion, for the determination (a) of the fair value of the property of The Ohio Bell Telephone Company, toll and exchange (b) of the just and reasonable rates and (c) of reasonable rules and regulations for services furnished by said company to its patrons throughout the State of Ohio.

Opinion and Finding.

January 10, 1931, Commission found tentative valuation of $104,282,736—Protests were filed by the company and by the State—One asserted Commission's valuation too low, the other too high—Real estate purchased by company

but not presently used and useful no part of rate base—Former finding as to labor cost adhered to—Progressive obsolescence to be considered—Property on date certain 87% condition—Interstate property and income distinguished from intrastate property and income—Not necessary to separate intrastate toll property and revenue from exchange property and revenue—Prices of Western Electric to Bell Company fair and reasonable, both prior to date certain and subsequent thereto, except for increase of November 1, 1930—Going Concern Value reconsidered—Direct and undistributed overhead costs allowed found to be sufficient to cover separate allowance of going concern value—$3,592,040 allowed in tentative valuation for going concern value now disallowed as a separate item—Distributed or direct overheads allowed as follows: Plant Supervision and Tool Expense $3,354,980; Incidental Expense $655,360; Supply Expense $2,188,885; Contingencies $145,553; Building Overheads $1,280,861; Western Electric Engineering Service and Inspection $1,100,378; Total of direct overheads $8,726,017, present value $7,496,264—Undistributed Construction Expenditures allowed as follows: Omissions 1%; Interest During Construction 6%; Engineering 5%; Taxes 1%; General Expenses 2%; Total 15%—Some of these allowances applicable to all the property and some applicable to only a portion thereof—Amount allowed Omissions $697,120; Interest During Construction $4,953,996; Engineering $2,779,056; Taxes During Construction $825,666; General Expenses $1,651,332; Total as of Date Certain $10,907,170; Total Overheads $18,403,434, 24.5% of total value of fixed capital exclusive of overheads—Right of Way fixed on book value at $1,243,034—Working Capital and Materials and Supplies $2,948,502—Statutory rate cannot be altered until Commission fixes different rate—Reasonable rate as of date certain fixed in consideration of predictable or experienced changes that it may produce a proper return for a reasonable time—Rate based upon value of property and net income at date certain, but future value fixed with consideration to price trends—Price trends considered and ascertained—Company-wide case instituted in October, 1924, for determina-

tion of valuation, expenses and rates of the company for its services as a whole—Commission's inquiry since proceeded on Company-wide basis without separate testimony in Pence Law Cases—Right of Commission to fix rate for separate exchanges by considering value of the property enmasse questioned—Company divided exchanges into groups and fixed rates—Company rates as fixed for each exchange represent balanced consistent rate for entire territory in harmony with value of property used in each exchange—Company and representatives of State and municipalities acquiesced in Company-wide treatment—Company estopped by its action during trial of the company-wide case to now test rate for each exchange by separate determination of value and net income—Commission justified in fixing rate in each municipality upon relative valuations recognized by Company when it grouped its exchanges—Valuation as of date certain found to be $93,707,488 being a reduction of $10,575,247 from the former tentative valuation—Rates for succeeding years fixed on consideration of conditions and betterments and price trends—Valuation of property over-emphasized—Years consumed on this problem with slight attention to revenues and expenses—This is common of most cases—At a return of 7% every million dollars of value effects rate payers only to the extent of $70,000 annually, less than ten cents for each subscriber—Based on 7% rate of return, each dollar of revenue and expense has fourteen times as much weight on the ultimate result as any dollar of valuation—Company required to make reservations for surplus, depreciation and contingencies and other proper matters—Commission required to ascertain adequate charges for depreciation—Utility entitled to earn fair return upon investment and to maintain property in state of efficiency corresponding to the progress of the art or industry—As depreciation reserve is earned, it should replace deteriorated, obsolete and useless items—Policy of company important factor in determining proper depreciation allowances—Company's property well maintained—In addition to expenditures for maintenance and charges to reserve for depreciation, company at date certain had accumulated reserve balance of $12,560,502, $228,739

being for amortization of intangible property—As of December 31, 1932, reserve for accrued depreciation and amortization $20,569,893, approximately $306,000 of which is reserve for amortization of intangible capital—Balance in reserve shows accumulated amount to replace depreciated property in future which customers have paid in advance of writing the property out of plant account—Definite relation between past accumulations from reserves and proper allowances for future—Up to December 31, 1931, book value of gross additions were $181,971,638 and gross reductions $88,419,086, disclosing that entire money value of fixed capital at September, 1921, date of merger of telephone properties in Ohio, became fully retired during 1931—The gross deductions at end of 1930 $74,674,366, within $600,000 of entire money value of fixed capital September 21, 1921—Composite rate of 3.74% of depreciable property expended annually amply sufficient considering large sums expended before and after date certain for maintenance and repair—Plant substantially reconstructed—Composite rate of 4% of depreciable property fair annual allowance for depreciation expense computed on present value of depreciable property as of the date certain and for subsequent years plus net additions—$3,373,236 fair amount to be allowed for depreciation expense for 1925 allocated between interstate and intrastate—Important questions raised by license contract with the A. T. & T. Co.—Amount of license fee 1923 4½% of gross earnings; January 1926 4%; January 1928 2%; and January 1929 1½%—Cannot agree with finding of Statutory Court in Chicago Case—Depreciation of instruments fixed at 3% instead of 6% as allowed by the Statutory Court—License agreement provides for services by the A. T. & T. Co. to its associate companies—Broad field occupied by A. T. & T. Co., owning many subsidiary companies and having wide field of operation—All license contract costs analyzed in detail and allowed in part and disallowed in part as appears on Appendix "H"—Other expenses including office, instrument, patent infringement, taxes and costs of financial transaction allowed in part and disallowed in part—Company entitled to fair return on value of property used—Company enjoys monopoly in ter-

ritory, business substantial, properties favorably located, management high grade, financial position favorable—Fair rate of return on value of intrastate property 7% for 1925 to 1929 inclusive; 6½% for each of the years 1930 and 1931 and 5½% for each of the years 1932 and 1933—Based on Commission's finding as to value, the Company received rates of return as follows: 1925, 8.95%; 1926, 9.01%; 1927, 8.79%; 1928, 8.57%; 1929, 8.09%; 1930, 7.52%; 1931, 7.64%; 1932, 6.18%; 1933, 5.51%—Company entitled to earn as its net income from intrastate business for 1925, $6,559,524; 1926, $7,123,734; 1927, $7,772,557; 1928, $8,569,241; 1929, $9,433,590; 1930, $9,469,398; 1931, $9,442,658; 1932, $7,349,411; 1933, $6,959,232—Company collected on intrastate business an excess net income as follows: 1925, $1,822,647; 1926, $2,041,483; 1927, $1,986,610; 1928, $1,925,301; 1929, $1,463,347; 1930, $1,481,689; 1931, $1,659,760; 1932, $908,335; a total of $13,289,172—No excess of net income for 1933—Finding that the rates for services rendered on the date certain are unjust and unreasonable and that the company be required to submit new schedules setting forth rates as of date certain, giving first consideration to proper reductions of increased rates, which shall produce net income not in excess of that found to be fair and reasonable—Order that of the excess net income there be repayments by company in the manner provided by law to consumers entitled thereto.

By the Commission (Geiger and Schaber concurring):

On January 10, 1931, this Commission found the tentative valuation of the property of The Ohio Bell Telephone Company used and useful in furnishing service within the various municipalities of the State of Ohio together with the value of the property used for toll service, both interstate and intrastate, to be as of June 30, 1925—$104,282,735. (See Annual Report of the Public Utilities Commission of Ohio, 1931, pages 61, *et seq.*)

The Commission in announcing its opinion at that time set out in such detail the development of the several rate cases affecting various exchanges into the present company-

wide case through its order of October 14, 1924, that the same need not be here repeated.

Protests Filed.

On February 7, 1931, and February 9, 1931, the Company, the Attorney General and special counsel and the law directors and city solicitors of many of the cities in which the Company operates, associated with the Attorney General, filed their respective protests to the valuation so fixed by the Commission. The protests cover many points in such detail as to preclude specific enumeration, but they may be briefly summarized as follows:

Protest by the Company.

The Company protested the valuations, both reproductive and present, in that the same are inadequate, incomplete, inaccurate and too low, both in the aggregate and in the respects detailed in said protest. The Company claims that both in the aggregate and with respect to the separate accounts the true value of the property is substantially in excess of the value found by the Commission, and asserts that in all respects set out in its protest the finding of the Commission is unlawful and that if the same became final, the valuation would result in confiscation of the Company's property and would deprive it of such property without due process of law.

Protest by the State and Municipalities.

The protest filed on behalf of the telephone users of Ohio and of the municipalities and communities thereby affected is directed against the tentative valuation for the reasons specifically set out, in which it is claimed that the Commission's valuation is too high with respect to the accounts enumerated in said protest which cover substantially the entire property of the Company. The alleged excessive valuations of each class of property are specifically enumerated.

In short, each side protested the tentative valuation fixed by the Commission for the reason that the Commission had

not adopted the valuations claimed by each, one side asserting that the Commission's valuation is too low and the other too high.

Due to the fact the late Attornies General of the States, who by the statute were required to designate the legal advisor of the Commission, have throughout this proceeding acted on behalf of the telephone users of the State in an adversary capacity, the Commission has been compelled to proceed without the benefit of counsel.

The Commission does not feel called upon to go into a detailed re-examination of all the evidence which led it to make its tentative valuation, but will confine itself to matters particularly stressed in the protests and supporting briefs, or which are drawn in question by decisions of the Supreme Court of the United States and other courts announced subsequent to the Commission's tentative finding, or by the application of principles announced in recent decisions of high courts on pertinent matters.

Matters Stressed in Brief.

While counsel for the Company at the time of the filing of its protest to the tentative valuation filed no formal brief, they have since prepared and submitted as of October 17, 1933, a very exhaustive brief covering over three hundred printed pages in answer to the brief of counsel for the state and associates filed August 18, 1933.

These briefs impose upon the Commission the duty of considering all matters thus called to its attention, whether they relate to that portion of this case which preceded the Commission's finding of value as heretofore announced or relate to matters presented at a subsequent date.

While we will take up the several matters presented by each counsel for orderly disposition, it may not be possible to discuss them in the order followed by counsel nor to specifically refer to each point stressed in the respective briefs.

Specific Criticisms by Company's Counsel.

It is asserted by counsel for the Company that, reduced to lowest terms, the State's brief establishes the case of the

Company, not only for its present rate, but for substantially higher rates, for the reason that it is only by urging in the State's favor all the points decided by the Commission against the State and all the points decided by the Federal Statutory Court against the city of Chicago, Ill. in the case of the Illinois Bell Telephone Company *v.* Gilbert *et al.*, Fed. Supp., 595, that the State is able to arrive at rates of return therein set out varying from the high of 8.37% in 1926 to the low of 6.33% in 1931. Counsel for the Company point out that as contrasted with these rates of return and adopting the Commission's tentative value of $104,000,000 and conceding all the adverse holdings of either the Commission or the Federal Court, the rate of return upon the intrastate property would vary from the low of 4.28% in 1932 to the high of 6.24% in 1926.

It is urged that the Company's return has fallen short of a fair return by amounts varying from the high in 1930 of $3,254,877 to the low of $1,119,050 in 1928.

Real Estate.

Counsel for the Company criticise the Commission in its refusal to allow as part of the rate base the value of the real estate acquired by the Company but not presently used, and cite many cases in which it has been held that such property should go into the rate base on the theory that there is an obligation on the Company to acquire selected pieces of real estate advantageously located at favorable prices in anticipation of future use, rather than to await the time when such real estate is actually needed and must then be acquired at greater price.

The Commission based its refusal to allow the value of such real estate to go into the rate base upon the theory that the statutes of the State are explicit in that only used and useful property shall be included in the rate base and that lands purchased for future use, if not actually used on the date certain, must be excluded, but that their value may be considered to enhance the rate base as of the date when they are actually put in use. This has been done, as shown in Appendix "C."

We think this is in harmony with the holding of the Supreme Court as evidenced in the Logan Gas Case, 121 O. S., 507, and subsequent decisions of the Court and until there is a reversal of this, the Commission is bound by this declared position of our Supreme Court.

Labor Costs.

Company's counsel discuss at length (Brief, Page 23, *et seq.*) the assertion that the Commission should add to the value of the property an amount of not less than $12,000,000, which counsel claim was wrongfully withheld from the valuation by following the erroneous theory as to labor costs advanced by the witness Hagenah, it being claimed that had the Commission followed the actual experience of the Company as to costs of labor as disclosed by the Company's books when engaged in large enterprises, rather than the theory of Hagenah that labor prices should be computed as in a "wholesale construction," that there would have been added to the tentative value at least $12,000,000.

We have again given this matter consideration and do not feel justified in disturbing the former finding of the Commission upon this point.

Percent Condition.

A serious complaint is made by counsel for the Company (Brief, Page 33, *et seq.*) as to the finding by the Commission that the property on the date certain was in 87% condition rather than in 90% as claimed by the Company.

The 3% difference between the condition as found and the condition as claimed, translated into dollars, would add nearly $3,000,000 to the present value of the property, and is consequently of major importance.

Three witnesses for the Company, well qualified and familiar with the property, testified; one to a weighted average of 90.09%, another to 89.5% and the third to 90.01%, whereas Hagenah, the engineer for the State, testified to 87% condition.

The challenge of counsel has called upon the Commission to again read the testimony of these engineers, and it may be said that counsel have set out in their brief a fair

synopsis of the evidence of each. Counsel challenge the foundation for the statement of Hagenah that there is depreciation due to obsolescence and lack of utility.

The Commission, upon the original hearing, was impressed with the testimony of Mr. Hagenah and followed his estimate without an extensive discussion. The Commission also considered other evidence of condition, presented by the record.

This Commission has had occasion to discuss at length the question of obsolescense in Case No. 5672 in re Cambridge Home Telephone Company, Annual Report P. U. C. O. 1930, pages 117-128. It is there pointed out that Section 499-9, G. C. paragraph E, provides that the Commission shall find depreciation, if any, for *obsolescence*. The Commission there stated:

> "The advance of an art is constantly making effective the element of obsolescence, and such element does not assert itself at a given instant but develops gradually in proportion to the advance of the art."

In order that we may visualize this element of depreciation to which, under the statute, we must give consideration, we should consider that the property of the Company scattered throughout the various cities and villages of Ohio was undergoing a pronounced change, in that in many cities it was the result of the combination of two companies with duplicated property. It is true that it is claimed that the combination had been completed and the property had for some time been in operation as a single unit, but it also appears from the evidence that there was a continual change going on which required the elimination of many kinds of property which still had useful life, due to the progress of the art and due also to the ever present pressure of municipalities to rid their streets of overhead wires and poles. Much money has been expended by the Company in changing from aerial to underground construction.

These matters in our judgment, point to the fact that there was a solid basis for the former judgment of the Commission, that the element of progressive obsolescence was constantly at work to lessen the value of all depreciable prop-

erty beyond the one element of observed physical depreciation due to wear and tear or use and exposure as denominated by Mr. Sloan. We, therefore, feel that we must adhere to the former judgment of the Commission. The percent condition of each class of property is set out in detail in Appendix 'A.'

For an extended discussion of a similar subject see, In re Chesapeake and Potomac Telephone Company *v.* Public Service Commission of Maryland, November 28, 1933.

RE-EXAMINATION OF VALUATION OF CERTAIN ITEMS.

There are certain items which call for re-examination in view of a more detailed study of the principles laid down in Smith *v.* Illinois Bell Telephone Company, 282 U. S., 133, 75 L. Ed., 255; Illinois Bell Telephone Company *v.* Gilbert *et al.*, 3 Fed. Suppl. 595, and Los Angeles Gas & Electric Corp. *v.* Railroad Commission, 289 U. S. 287, 77 Law Ed., 1180.

Toll Service;—Interstate and Intrastate.

> "A recent decision of the Supreme Court (The Illinois Bell Telephone case) may require some modification of this figure and make it necessary to further classify this toll property into property used and useful in intrastate service as distinguished from interstate service."

The Supreme Court in the Chicago case stated:

> "The proper regulation of rates can be had only by maintaining the limits of state and federal jurisdiction, and this cannot be accomplished unless there are findings of fact underlying the conclusions reached with respect to the exercise of each authority."

This matter is discussed at large by counsel for the Company, Brief 302 to 314, inclusive, and by counsel for the State, Brief, page 70.

A State Commission in fixing intrastate telephone rates of a company which also furnishes interstate service must

separate the intrastate and the interstate property, revenues and expenses and make specific findings as to the value of the property devoted to intrastate service. Chief Justice Hughes gives a very clear analysis of those principles which compel the separation of the property devoted to the two classes of toll service and states:

> "While the difficulty in making an exact apportionment of the property is apparent, and extreme nicety is not required, only reasonable measures being essential, it is quite another matter to ignore altogether the actual uses to which the property is put."

The Commission in its order of October 14, 1924, by which the company-wide case was initiated, ordered the Company to file its inventory.

> "of all its property located in the State of Ohio used and useful and to be used and useful in furnishing telephone service therein *both toll and exchange.*"

The Commission did not at that time appreciate the importance of distinguishing between the property used for interstate toll service and that used exclusively for intrastate service. However, there is sufficient evidence, as disclosed by the record made prior to our former decision, supplemented by the additional evidence submitted by the Company since, to enable us to make a reasonable separation between the property devoted exclusively to interstate service and that devoted to intrastate service, both toll and exchange.

Following the decision of the Supreme Court in the Chicago case, we have made a study of the property devoted to, and the income arising from, interstate service as distinguished from intrastate service.

Over a considerable period, a large force was employed by the company in typical exchanges to time the toll and exchange lines as the same were used for interstate and intrastate service and to make an extended analysis of toll tickets. We have no reason to doubt the accuracy of this division between interstate and intrastate property

and income, and we adopt the company's conclusion, as shown by its Exhibits. These allocations, expressed in terms of percentages, are shown on Appendix "L."

Intrastate Toll and Exchange Property and Revenues.

No evidence has been adduced by which we can allocate the intrastate property of the Company as between exchange service and toll service.

The Supreme Court pointed out that the Company in separating its interstate and intrastate business attributed the property used at the subscriber's station and from that station to the toll switchboard or to the toll trunk lines entirely to intrastate service, and held that this was erroneous for the reason that the subscriber's station and other facilities of the Company used in connecting with the long distance toll board are employed in the interstate transmission and reception of messages.

By a parity of reasoning, it is apparent that the subscriber's station and other facilities of the Company which are used in connecting with long distance toll board for an intrastate message are employed in toll service as distinguished from exchange service, even though such toll service is complete within the limits of the State.

To segregate intrastate toll property and revenue from exchange property and revenue would be almost impossible. Fortunately the Company, the State and the several solicitors are in agreement that there need be no such separation.

Western Electric Prices.

The Supreme Court in the Chicago case held that:

> "Findings should be made as to the net earnings of a supply company from the manufacture and sale of equipment to an affiliated operating telephone company, in order to determine the fairness of the prices paid for equipment in a case involving the adequacy of telephone rates."

The Commission found in its tentative valuation that the Western Electric Company had not overcharged the Ohio

Bell Telephone Company for equipment sold by it to that company. In view of the Supreme Court's holding in the Chicago case, we feel that we may not finally determine this point without further examination of the evidence adduced since the announcement of our tentative valuation.

New Evidence.

During the year 1932 the Chicago case was being heard before the Statutory Court under the mandate of the Supreme Court. Accountants engaged in the Chicago case furnished evidence in the present case on matters concerning which testimony had been given and the Illinois Commission made available the services of its engineers. Counsel in this case entered into a stipulation covering the testimony of the Chicago case in so far as it related to four issues, namely: Western Electric profits; A. T. & T. License contract service cost; separation of interstate and intrastate plant, revenues and expenses and the rate of return.

Finding of the Statutory Court on Western Electric Prices.

The Statutory Court in compliance with the direction of the Supreme Court made definite findings of fact touching the relations between the Bell Company and the Western Electric Company, as appears specifically in Findings 14 to 20, inclusive. The Court found that the prices of goods sold by the Western Electric to the Bell Company were fair and reasonable and no higher than those charged other purchasers and that the earnings of the Western Electric were not excessive.

In Finding 19 the percent of earnings and profits of the Western Electric Company on sales to its Bell customers for the years 1916 to 1930 inclusive are set out. Finding 20 is to the effect that the sales of the Western Electric have been representative of the sales of that company to all Bell customers and that the earnings made by the Western Electric in the Chicago area have been fair and reasonable except that for the period after November 1, 1930,

there should be a reduction of 10% from prices charged by the Western Electric.

The State has presented its views of the Western Electric operations in great detail in counsel's brief pages 11 to 40 inclusive. It is urged by the State that 7% would constitute a fair return upon the value of the property of the Western Electric used for Bell service and that any profit above that amount is excessive and should be eliminated from the valuation of the Bell Company.

The summary of the State's claim is set out graphically in Appendix "B" of the State's brief pertaining to the valuation of June 30, 1925, the date certain, and Appendix "E" pertaining to subsequent valuation. These percentages are converted into dollars in Appendix "B", and show the State's claim that the reproduction value of the property by the Commission as of June 30, 1925, was excessive in the sum of $2,029,441.00 and that for the last six months of 1925 Western Electric profits were excessive in the sum of $188,000; and for 1926, $303,000; 1927, $535,000; 1928, $425,000; 1929, $341,000. For the year 1930 there was a loss to the Company of $47,538 (Appendix "E", Line 16).

Day Certain.

We are required to fix the value of the property as of "a day certain" to-wit: June 30, 1925. The Statutory Court estimated the return to the Western Electric from its Bell business for each of the years from 1916 to 1932. During that period the highest estimate of return was for the year 1921 computed by the Court at 10.7%.

All the estimates of return by the Court in the Chicago case and by the State in this case are based upon book value without an actual appraisement of the property of the Western Electric. The engineers who valued the property of the Bell Company in the instant case used values of items furnished by the Western Electric based upon its price lists. For all the years prior to 1925, as found by the Court, the earnings of the Western Electric were less than 7%, except for the single year 1921. For the five years from 1925 to 1930 inclusive, the Court finds that the profits were in excess of 10%, being as high as 15.8% in 1928. In

1930 and 1931 they are found to be slightly over 7%, while 1932 shows a loss of 3.3%.

The figures set out in the State's Brief, Page 30, do not predate the year 1924 for which year the percent of return is asserted to be 10.3% with a substantial increase for the years thereafter until 1930, reaching the high point of 20.3% in 1928.

We have only one year of the State's estimate of the earnings prior to 1925 and we do not feel that that is a safe basis for discarding the finding made by the Court that there was no excess profit enjoyed by the Western Electric. It is proper that we call attention to the fact that the percents indicated by the State, as disclosed by the table in the brief, were computed "after correcting for all the foregoing adjustments." While we may concede that the State is right in some of the adjustments asserted, we are not in harmony with many of them.

Proper Profit of the Western Electric.

In considering a proper profit for the Western Electric beyond which there would be an undue drain upon the resources of the Bell Company, it must not be lost sight of that while the Western Electric is the manufacturing department of the Bell Company, yet it is not, in fact, a public utility whose profits can be made secure by an order of the Commission. It is a manufacturing company whose income may dwindle in lean years below that which could be considered fair for a controlled utility and it may even encounter losses.

The Western Electric, while closely associated with the Bell Company and having a fairly constant market in supplying the requirements of that company, yet occupies the position of a hazardous undertaking, and its profits may fall without the supporting order of a regulatory body. If its profits may so fall, they likewise should be permitted to rise within proper limits without the regulating restraint of the Commission.

It might be said that there is no attempt to control the prices charged by the Western Electric to the Bell Company, but that the Bell Company should be penalized for

paying these prices, inasmuch as the profits of both companies flow into the same treasury through the common holding company. In a measure this is correct, but there has been no showing that the prices charged by the Western Electric were "exorbitant."

The Supreme Court in the Chicago case in syllabus 7 and in its discussion of that head note, does not find nor intimate that the Western Electric should be confined to a profit only equal to that allowed to the utility. Chief Justice Hughes in speaking of the fairness of the prices uses the phrase that "the City had failed to support its contention that these prices were exorbitant."

In the later case of Western Distributing Company *v.* Public Service Commission of Kansas, 285 U. S. 199, 76 L. Ed. 655, the Court goes no further than to hold that where the total capital of several companies is embarked in one enterprise, the reasonableness of the inter-company charges may be the subject of inquiry and scrutiny, and that the state authority is entitled to a showing of the fairness and reasonableness of the price for gas paid by the distributing company to its associate producing company.

The rate fixing body has the right and duty to closely scrutinize inter-company charges, to see that no unjust burden is placed upon the utility whose rate is under investigation, but this does not mean that the profit of the non-utility company is to be limited by the same rules that govern the rates to be charged by the associate utility. The Supreme Court has suggested a broader rule in Wabash Valley Electric Co. *v.* Young, 287 U. S., 488, at 497.

The finding of the Statutory Court in the Chicago case on this important matter will be reviewed by the U. S. Supreme Court at an early period, the case having been set for hearing before the Supreme Court for January 15, 1934. Should the Statutory Court be reversed by the Supreme Court, it will be a comparatively simple matter to readjust the estimate as it affects the Ohio case.

After considering the additional evidence offered and in harmony with the decision of the Statutory Court, we are not disposed to disturb our former finding as to costs of purchases from the Western Electric in determining the

reproduction cost of property of the Ohio Bell Company as of June 30, 1925, nor are we disposed to further question the costs of the purchases from the Western Electric subsequent to that date except as to the price increase of 10.2% effective November 1, 1930, which increase is disallowed as to all purchases subsequent to said date.

The amounts in dollars claimed by the State as excessive for the years subsequent to 1925 are not impressive, when considered in connection with the volume of goods sold by the Western to the Bell Company during those years. Our former finding on this matter is affirmed.

GOING CONCERN VALUE:

The Commission in its opinion fixing the tentative value had occasion to discuss at length going concern value and allowed the sum of $3,592,040 or 3¾% of the value of the physical property as the proper amount.

Counsel for the Company points out that the Commission failed to include as part of the going concern value 3¾% of the undistributed construction expenditures of $16,523,387.00 amounting to $619,627.00 and in Statement No. 3 filed with the Commission on June 14, 1933, has readjusted the value by the addition of this amount.

The State on page 10 of its Brief in support of its claim that "Going Concern" value should be disallowed, merely asks that the Commission again refer to its former brief filed April 30, 1930.

Going concern value has been discussed by the Commission in many cases, see:

Ohio Bell Telephone Co., P. U. C. O. Rep., 1931, P. 61 at P. 71.

Cambridge Home Telephone Company, P. U. C. O. Rep., 1930, Page 117, PP. 131-134.

Appeal of Columbus Gas & Fuel C---any, P. U. C. O. Rep., 1930, p. 117, pp. 131-134.

It discussed the matter at length at the time of fixing the allowance in the instant case and the testimony need not be further commented upon.

In commenting on the undistributed overheads allowed in the former finding, the Commission said:

> "The Commission may not, of its own motion, include in the items covered by these percentages, the item of going value, when the witnesses with the possible exception of Mr. Allensworth have each severally stated that it was not considered in their estimate of percent."

The Commission adopted 3¾% in substantial harmony with the amount allowed by the Illinois Commission and endorsed by the Statutory Court and not further discussed by the Supreme Court in the Chicago case.

Since our allowance of the going concern value in this case we again discussed the question in the Columbus Gas case, *supra*. In that case we allowed 14% to cover the undistributed construction cost and said in reference to going concern value:

> "We are not impressed with the fact that a going concern value amounting in the aggregate to millions of dollars can be built up on the theory that expenses are to be incurred after the property has been reproduced which were not, as a matter of fact, incurred in the original construction of the property."

Since our former decision we have had the recent illuminating case of The Los Angeles Gas & Electric Corporation *v.* Railroad Commission of California, 289 U. S., 287, 77 L. Ed., 1180. In that case Chief Justice Hughes discusses at length under Division 8 the disallowance by the California Commission of an item in excess of $9,000,000 for "growing value." The Chief Justice has marshalled in his opinion all the Supreme Court cases touching this point.

The Chief Justice says:

> "The concept of going value is not to be used to escape the just exercise of the regulatory power in fixing rates, and, on the other hand, that authority is not entitled to treat a living organism as nothing more than bare bones."

> "It does not give license to mere speculation; it calls for the consideration of the history and circumstances of the particular enterprise and attempts at precise definition have been avoided."

The Chief Justice details the finding of the California Commission and concludes that the base rate of $55,500,000 was sufficient to cover the value of the property including any element of "going concern value" that might exist. It was pointed out that certain items improperly included in the rate base might be deducted and that there would still remain a sufficient amount to cover any item of going concern. The Court says:

> "The record affords no basis for criticising the allowance made by the Commission for materials and supplies and working capital, and thus the entire excess may be regarded as applicable to whatever intangible value the property had as a going concern."
>
> "The fact that this margin in the rate base was not described as going value is unimportant if the rate base was in fact large enough to embrace that element."

In commenting upon the testimony of the witnesses as to going value, the Court says:

> "It is unnecessary to analyze the testimony of these witnesses, as it is obviously too conjectural to justify us in treating the failure to include their estimates as a sufficient basis for a finding of confiscation."

We think this comment of the Court might well be applied in the instant case to the witnesses of the Company concerning this item, which is by them treated as "cost of establishing business" rather than as "going concern value" and includes as a basis for the calculation many items to which the Supreme Court's designation "too conjectural" is pertinent.

In view of these decisions, we conclude that the Commission is not bound by the method in which the engineers presented their evidence as to the value of the property, nor by the fact that they each, save Mr. Allensworth, may have dis-

claimed intention to include within their estimate the going concern value, but that we are free to determine whether or not the final value found by us, is, as a matter of fact, sufficient to include going concern value. In other words, the Commission is free to examine the testimony as to basic value to determine whether there has been sufficient valuation to cover those items that might contribute to going concern value.

As to the right of the Commission to use its own judgment, see Portsmouth Gas Co. *v.* P. U. C. O., 119 O. S., 24, at P. 57.

Going concern value must be proved as any other item of valuation. While it has been repeatedly held that it is a proper element to be considered, no specific rule has been laid down as to what the value should be, but the particular conditions in each case must govern. No fixed rule can be based upon a per customer expenditure or a percentage of the property involved.

Mr. Schneider in his Exhibit No. 3 includes an item for "Cost of establishing business" and the Company's witnesses confined their testimony to "cost of establishing business" rather than to "going concern value."

Mr. Hagenah testified as to "going concern value" and estimated it at 10% of property value. Mr. Allensworth made no separate allowance for the reason that the Company did not show that it had ever incurred any cost of establishing the business that has not been absorbed currently as operating expense.

Our Supreme Court in the case of Cincinnati *v.* P. U. C. O., 95 O. S., 554, disapproved the item of cost of attaching business and in the case of City of Cleveland *v.* Public Utilities Commission of Ohio, 98 O. S., 462, it again expressed its disapproval of the allowance of any sum as a part of permanent capitalization for cost of attaching business, yet we prefer to consider that the evidence of the company, while specifically directed to the condemned item of attaching business, is relevant to the broader consideration of "going concern value" or "going value."

On the subject of going concern value we have several expressions of our Supreme Court and invariably it has held

that where a sufficient allowance is made for overheads comprising engineering, administrative and legal expenses, liability insurance, taxes and interest during construction and for omissions and contingencies, the requirements of going concern value have been met. Lighting Company *v.* P. U. C. O., 118 O. S., 592; Logan Gas Company *v.* P. U. C. O., 121 O. S., 507; Cincinnati *v.* P. U. C. O., 113 O. S., 259.

The latest pronouncement of the Supreme Court of Ohio on this matter is found in the case of Columbus Gas & Fuel Company v. P. U. C. O., decided June 21, 1933, 127 O. S., 102. The Court says:

> "The members of the Commission were unanimous in the disallowance of going concern value as a separate item. In a number of cases this Court has affirmed such action by the Commission. City of Cincinnati *v.* Public Utilities Commission, 113 O. S., 259; Hardin-Wyandotte Lighting Company *v.* Public Utilities Commission, 118 O. S., 592; Logan Gas Company *v.* Public Utilities Commission, 121 O. S., 507.
>
> Similarly the Supreme Court of the United States in a recent case, Los Angeles Gas & Electric Company *v.* Railroad Commission of California, *supra*, refused a going concern value claim of approximately $9,000,000.00. This Court is of opinion that in the instant case this refusal was proper."

Considering that our valuation is of a plant in actual and successful operation, and that we have made (*post*) what we regard as ample allowance for direct and undistributed overhead construction costs and that no specific costs have been established that are not covered by such allowance, and considering also that many items testified to are "too obviously conjectural" and giving weight to the definite declarations of both the Supreme Court of the United States and of the State of Ohio, we have concluded that the testimony offered does not justify a separate allowance of going concern value, either as such or as "cost of establishing business." We therefore now hold that the amount, tentatively allowed by the Commission, of $3,592,040.00 as going concern value should be eliminated as a separate item.

Overheads—Direct and Indirect.

To correctly determine the value of these several overheads, we must make a careful analysis of the testimony upon which they are based.

Distributed or Direct Overhead.

In the theoretical reconstruction of a property the engineers add to labor and material costs certain percents for plant supervision, tool expense and incidental expense applied to the direct labor cost, and for supply expense, a percent of the material cost. There are many details of these main divisions including sundry items which cannot be mentioned at length.

Unfortunately the several engineers do not so treat these overheads that the testimony of each may be accurately compared to the testimony of others, but we are able to give a fair analysis in spite of this lack of uniformity in treatment and terminology.

Plant Supervision and Tool Expenses. (Accts. Nos. 221 and 232 to 256 Incl.).

The most important overhead included in unit costs is that of plant supervision, which Mr. Williams estimates at 18.5%, Mr. Hagenah at 17% and Mr. Allensworth at 10%.

Mr. Williams in considering plant supervision at 18.5%, added 4% for the item of tool expense which was separately estimated by the other engineers.

Mr. Hagenah estimates 17% for supervision excluding tool expense and as to that item he fixes an average of 2% based upon an analysis made by Engineer Dorsey who had estimated it at from 1.31% to 5% averaging slightly in excess of 2%.

Mr. Allensworth estimates 10% for supervision and 2% for tool expense.

Comparing the estimates of the three engineers for the two items of plant supervision and tool expense, we find 22.5% for Williams, 19% for Hagenah and 12% for Allensworth, all such percentages being confined to labor costs.

Visualizing a theoretical reconstruction of all the different plants, we are of the opinion that the costs could be kept within the limits allowed by Mr. Hagenah as it must be apparent that if the Company were engaged in a wholesale reconstruction of all its exchanges in its Ohio territory, it could well develop more pronounced economies than were disclosed in the actual construction upon which Mr. Williams bases his estimate. This allowance is estimated at $3,016,041 for plant supervision and $338,939 for tool expense, a total of $3,354,980.

We do not lose sight of the claim of the Company that the actual construction on which Mr. Williams based his judgment was of such importance as to be wholesale rather than piece-meal.

Incidental Expenses: (Accts. 251 to 253 Incl.).

This item is associated with plant supervision and is by Mr. Williams and Mr. Allensworth based upon direct exchange and toll labor and by Mr. Hagenah on direct toll labor only.

This incidental expense is not very satisfactorily explained or sustained by the witnesses. Mr. Dorsey, an engineer for Mr. Hagenah, allowed 20% of the labor costs for this item and stated, R. 2161, that it covered the cost of boarding the men and taking care of them on the toll line construction work, but that he allowed nothing for board and lodging in the construction of the exchange plant.

The development of this item by Mr. Dorsey appears on the Dorsey Exhibit Nos. 2 and 4. When this is translated into dollars in Account 251, Toll Pole Lines, Account 252, Toll Aerial Cable and Account 253, Toll Aerial Wire, it is estimated at $655,360—$388,888 being attributed to toll pole lines, all of which we allow. An allowance for board and lodging should not be made for the construction of exchange lines, on a reproduction basis.

Transportation of laborers and material is covered by the several engineers under different items so that it is impossible to make a comparison of the amount estimated by each for this expense, but we are convinced it is amply covered by an allowance for incidental expense.

Supply Expense: (Accts. 221 and 231 to 256 Incl.).

The item of supply expense is based upon material and is next in importance to plant supervision based upon labor and we have allowed the estimates of the engineers Williams and Hagenah for this item, and estimate it at $2,188,885. For details see Rec. 556-2153-2160-3287-3288, the allowance being 6% of material value in Accounts 231 to 233; 241 to 245 and 251 to 255 and 4% in Accounts 221, 234, 235, 246 and 256.

Contingencies: (Accts. 221, 222, 234 and 235).

This item is computed by Engineer Williams at 1% of the material cost in Accounts 221, 222 and 234 and at 10% of the labor cost in Account 235. It covers sundry items explained, Record, page 535. Hagenah agrees with Williams as to the valuation of the property to which this overhead was added and it is estimated at $145,553, and allowed.

Building Overheads: (Acct. 212)..

In the estimate of the theoretical cost of reconstructing buildings the overhead percents are not added separately to the labor or material cost, but are imposed upon the total of such costs for the completed structure and include such items as contractors' overheads and profits, insurance, architects' fees and supervision, amounting in the aggregate to approximately 16.7% of the labor and material cost of the building. The total of such overheads included by the engineers in the value of buildings is estimated at $1,280,861, and is allowed.

Western Electric Engineering, Service and Inspection: (Accts. 221, 222, 233, 234, 243 and 253).

There is added to the cost price paid to the Western Electric Company for goods furnished by it to the Bell Company, a 7½% overhead for engineering fees on central office telephone equipment amounting to approximately $931,260 and more than 4% for service and inspection of wire furnished by the Western Electric, amounting to approximately $169,118, both of which items we have allowed

as included by the engineers in their valuations of the property.

Direct Overheads Translated into Dollars.

The entire physical property as disclosed by the appropriate I. C. C. account numbers show as a result of our allowances the following estimated sums added to the unit costs, entering into the reproduction of the physical property:

Plant Supervision	$3,016,041
Tool Expense	338,939
Board and lodging applied exclusively to toll line construction	655,360
Supply Expense	2,188,885
Contingencies	145,553
Miscellaneous applied exclusively to building construction	1,280,861
Western Electric Engineering	931,260
Western Electric Service and inspection applying to wire	169,118
Total	$8,726,017

This total added reconstruction value for distributed or direct overheads of $8,726,017 reduced to the present value, amounts to approximately $7,496,264. All these sums we have allowed at their appropriate places.

There are certain other overheads included in unit costs which could not be sufficiently identified to permit separation. These omitted items consist of such overheads as stable and garage expense included in labor units and freight, cartage, loss and breakage covered in material units, which in our judgment have been properly allowed.

Undistributed Construction Expenditures.

After the above direct overheads have been added to the physical value of the property there is still the further group of percents of overhead expenses identified as such, representing undistributed construction expenditures.

The Commission in its former opinion on page 70 stated:

> "There is not the variance among the witnesses for the company and the State in regard to undistributed construction costs that we find in many other items in this case. The various witnesses have estimated this item as follows:

Williams and Schneider	17.11%
Sloan	16.67%
Hagenah	17.25%
Allensworth	14.54%

Considering the substantial additions that result from these percents, the Commission has made a further searching examination of the record that it may be advised as to the justness of these overheads and whether or not any of them are excessive and subject to elimination or revision.

Guided by the evidence that we can gather from the record and applying our own judgment as to the weight of such evidence, we find 15% ample to cover undistributed construction expenditures, and we have broken this general item into the several elements—Omission 1%; Interest During Construction 6%; Engineering 5%; Taxes During Construction 1%; General Expenses 2%—Total 15%. The evidence upon which we base our conclusions as to the component parts of the total allowance is pointed out below.

Having allowed 15% for undistributed construction expenditures, it does not follow that this shall be applied to all the physical property, plus the allowance for direct overheads. This is so for the reason that this 15% is based upon various items, some of which are applicable to all the property and some applicable to only a portion thereof. It is true that some of the engineers in testifying as to these undistributed construction expenditures have stated that in order to correctly estimate their value, the percent should be applied to the entire property and not limited to the percent of that property to which such particular overhead applies. To this view we do not subscribe.

It will be impossible within the proper length of this opinion to analyze the testimony of the several witnesses on undistributed overheads and we must confine ourselves

to naming the pages and exhibits on which we based our final conclusion.

Omissions—1%.

Williams, (Record 133, pages 140 to 146 of Williams' Exhibit 3-B, and pages 110 to 116 of Williams' Exhibit 7-C;) Schneider, (Record 199-201 and 656-674); Hagenah, (Record 2322 and 2323) and Allensworth (pages 3367-3371) testify in detail to this item, giving their several conclusions.

It has been well said that the engineers assume that all inaccuracies in inventories work to the detriment of the Company, whereas by the law of averages it is just as probable that they work to the benefit of the Company. We allow 1% for this item of omission. We feel, however, that the 1% for omissions should not apply to those items where an omission could not possibly occur or would be a risk properly assumed by the contractor and we do not believe that it should in this case be applied to rights of way, land, buildings or general equipment. We cannot conceive that there would be any chance of omissions in any of this class of property.

Interest During Construction—6%.

This item is testified to by the various witnesses (Record pages 697-709-767-2324-2327-3170-3368) and is computed at 6% except by the witness Hagenah who computes it at 6½%, all basing their estimates upon the theory that the theoretical reproduction project would involve a five year period, but that a service performing unit will be completed within a period of two years, for one-half of which time interest is computed upon the full value of the completed unit. We agree to the allowance of 6% and the average period of one year and that it should be applied to the full value of the completed property.

Engineering—5%.

The item of engineering is discussed by the various witnesses testifying on pages 677-678-685-759-2329-3170-3829. Williams, Schneider and Allensworth agreed on 5% for this item, while Mr. Hagenah estimates it to be 6%. We have

accepted 5% as the correct amount. We are, however, of the opinion that this 5% should not be applied to Right of Way—Account No. 207; Land—Account No. 211; Buildings —Account No. 212; Switchboards installed by the Western Electric Company included in Central Office Telephone Equipment—Account No. 221; Other Equipment of Central Offices—Account No. 222; Private Branch Exchanges—Account No. 234; Material value of wire in Interior Block Wires—Account No. 233; Exchange Aerial Wire—Account No. 243; Toll Aerial Wire—Account No. 253; nor to General Equipment—Accounts No. 261-265, inclusive.

The valuation of buildings was made by company witness Meyers under Account No. 212. The witness proceeded upon the assumption that the buildings were to be reconstructed by contractors and not by the Company, and he has added to the estimated contractor's cost overhead and profit for the contractor of 8%, an architect's fee of 6%, and architect supervision of 1½%, together with such items as 7% of the payroll for insurance and 1½% of the bid price for bond. In our judgment, the present value of buildings as arrived at by the method pursued by Mr. Meyers should not be further enhanced by allowing as an addition thereto an engineering fee. We disallow this engineering fee of 5% for buildings.

Central Office Telephone Equipment, Other Equipment of Central Offices and Private Branch Exchanges have an allowance of 7½% for engineering added to the material cost of switchboards installed by the Western Electric Company (Record 536-538). Interior Block Wire, Exchange Aerial Wire and Toll Aerial Wire have in their unit costs an addition of 4.7% of material value for Western Electric Company service and inspection.

We are not impressed with the claim that after the Western Electric has been allowed, in addition to the cost price quoted to its associated companies 7½% for engineering, that there should be a further sum of 5% as undistributed overhead for engineering, and we disallow the same.

General Equipment is not of such a nature as, in our judgment, to require an engineering service in addition to the overheads already allowed.

We are conscious of the fact that there are certain engineering services that would be required of and rendered by the Company's engineers in making preliminary surveys and estimates, as well as during installation, but we are of the opinion a general charge of 5% of the entire value of the physical property is not justified. The fair cost of this service is amply covered by the engineering and supervisory fees that we have allowed, both as direct and indirect overheads. Engineers' fees as such have been allowed in the amount of $2,779,056.

Taxes During Construction—1%.

This item was testified to by the various witnesses on pages 261-693-695-763-2326-Mr. Hagenah includes the same in general expenses. We conclude that 1% is sufficient to cover this item and that it should be applied to all the property.

General Expenses—2%.

We allow general expenses in the sum of 2%. This item was testified to by the several witnesses on pages 689-760-2325-3153-3267-3284. We allow this percent and apply it to all property.

Undistributed Expenses in Dollars.

The aggregate of the undistributed construction expenditures as developed by the several percents aggregating 15% and applied to present value restricted as indicated in Appendix "D", and translated into dollars is as follows:

Omissions 1%	$697,120
Interest during construction 6%	4,953,996
Engineering 5%	2,779,056
Taxes during construction 1%	825,666
General Expenses 2%	1,651,332
Total as of the day certain	$10,907,170

It must not be lost sight of that the percents we allow for undistributed construction expenditures attach to the direct overheads included in the unit cost of physical prop-

erty already allowed in the sum of $7,496,264 which reduced to dollars amount to approximately $1,000,000 from superimposing one class of overheads on another.

Total Overheads.

Distributed and undistributed overheads for which we have allowed an estimated total of $18,403,434 are 19.6% of the entire valuation of the fixed capital including all overheads, and 24.5% of the total value of the fixed capital exclusive of overheads.

We have discussed overheads somewhat at length and have translated them into dollars in order that it may be apparent that there have been very substantial allowances made for items closely related to those associated with going concern value. They are, of course, not identical, but if we were to allow going concern value as claimed by the company there would be many items which would overlap. See Going Concern Value, *supra*, page 18.

Right of Way.

The Commission in its findings made January 10, 1931, determined that an allowance of 3% of the value of the outside plant for right of way was reasonable; taking said percent as the measure of the value of right of way the Commission at that time fixed said value at $1,568,281. Protests to the amount of said valuation were filed by the Attorney General and various representatives of the municipalities and communities herein affected as well as by the Telephone Company, one side contending the amount allowed is too high and the other too low. As a result of these protests we have again gone into the evidence from which we find that the witnesses testifying upon the subject have relied upon different lines of reasoning for their final conclusion as to right of way value, some using a percent of the cost of the outside property and others using a cost per pole basis.

Section 499-9 of the General Code does not require the Commission to evaluate the right of way at its reproduction cost new, but rather contemplates that the Commission determine the fair value thereof. We fail to find in

the record any list or record of right of way owned by the Company, nor is there any evidence as to the market value as of the date certain. We conclude too, that as there is no market for right of way such as owned by the Telephone Company in this case, no valuation can be based upon market price.

It may also be noted that Mr. Williams, a witness for the company, testified that if the Company were reproducing the property, it would, in his judgment, be necessary to obtain right of way rights from either the cities or the property owners or somebody else. There is no evidence to the effect that the company would, in the event of reproduction, be required to pay any political sub-division for right of way.

The Uniform System of Accounts for Telephone Companies, in effect since 1913, requires right of way be included in the capital accounts and property values of a telephone company as follows:

> "This account should include the cost of all lands and interest in land acquired for the location of telephone wires, cables, pole lines and conduits; salaries and expenses of right of way agents; expenses of appraisers and of juries, commissioners, or arbitrators in condemnation cases; real estate brokers' commissions; cost of plats, abstracts, notarial fees, examination of titles, recording deeds, etc."

The company was therefore required to carry on its books the aforesaid accounts for right of way. The methods of fixing value of property rights, which should be a matter of record, as adopted by the witness for the company, do not appear to us satisfactory, and we conclude that in the present case the actual experience of the company as shown by its books is the safest guide to follow in fixing fair value of its right of way. The books of the Company show the right of way value as of June 30, 1925, to be $1,243,034. (Wood Exhibit 15, Line 25.) Our Supreme Court in the recent case of The Columbus Gas & Fuel Company *v.* Public Utilities Commission, 127 O. S. 109, stated that in valuing leaseholds used and useful, the

Commission may consider book value. We consider that such rule is applicable to right of way in the present case. We therefore hold that the best evidence of value in the record in this case is the book value and therefore conclude that $1,243,034 is the proper amount to be allowed as the fair value of right of way, and the former allowance is set aside and held for naught.

Working Capital Including Material and Supplies.

The Commission in its tentative valuation allowed for working capital including materials and supplies $3,500,000. Protests were filed by both parties to said allowance. The various witnesses who testified on this subject had separate or special formulas in arriving at a sum to be allowed for this item. Mr. Williams' figure of $6,350,000 is based on 5% of the reproduction cost new of the physical plant, less general equipment; Witness Sloan based his figure on consideration of eight weeks operating expense as one factor and 15% of gross revenue as another factor, rounded off at approximately $7.00 per telephone. Witness Hagenah based his allowance on five different methods, taking the average thereof as his final judgment for the amount to be allowed, and witness Allensworth based his on materials and supplies on hand on the day certain plus one month's operating expenses covering two payroll periods.

The matter of resorting to an arbitrary percent for such an allowance does not appear to us to be a satisfactory rule to be applied in this case and it would seem that the financial requirements of this particular company for working capital should be determined in a more scientific manner giving due consideration to its balance sheets, operating statements, credit requirements, billing practices, purchasing contracts, etc. It we cannot adopt the percent rule as urged by the Witnesses Sloan and Williams, we likewise cannot adopt Mr. Hagenah's figure for it is based upon an average of five methods which include a number which we must reject.

Company witness Cox testified that purchases from the Western Electric Company are billed at the end of the

current month and are payable thirty days thereafter. This indicates an average forty-five day line of credit on the bulk of purchases. Exchange revenues are billed subscribers in advance and toll revenues are billed in arrears. Exchange revenues (Account 500) average about four times the toll revenues (Account 510) indicating an advantage to the company. Sizeable amounts are carried on the company's books representing subscribers' deposits, and service billed in advance indicating that a part of the working capital, at least, is furnished by subscribers. It therefore appears that it is hardly necessary to speculate as to what is a proper allowance for this item when we have before us the actual experiences of the company.

It is our conclusion that the most satisfactory manner of arriving at the amount to be allowed for working capital is to take the average operating expenses for one month plus the value of material and supplies on hand June 30, 1925. This conforms to the basis testified to by Mr. Allensworth and to basis number four submitted by Mr. Hagenah.

In determining operating expenses we exclude reserves for depreciation but allow expenditures for rent and for taxes assignable to operations. Using this method we find the average operating monthly expenditure for the year 1925 to be as follows:

Current Maintenance Expenses	$395,363
Traffic Expenses	626,387
Commercial Expenses	191,611
General and Miscellaneous Expenses	81,344
Taxes assignable to Operations	215,914
Rent	47,547
Total (Excl. Deprec.)	$1,558,166

The value of materials and supplies as of June 20, 1925, is $1,390,336.32, a total of $2,948,502 which the Commission allows for working capital and materials and supplies as part of the rate base and the amount of $3,500,000 heretofore determined upon is set aside and held for naught.

The same method will be applied in fixing amount for working capital and materials and supplies for subsequent

years excepting that the amount of materials and supplies will be determined by taking the average of the amount on hand at the beginning of the year and end of year. The amounts to be allowed for the subsequent years are as follows: 1926, $2,923,563; 1927, $3,052,701; 1928, $3,218,291; 1929, $3,451,024; 1930, $3,250,138; 1931, $2,804,990; 1932, $2,497,696; 1933, $3,044,894. See Appendix "E" for details.

LAW GOVERNING CASE.

While this case has assumed the status of a company-wide case by virtue of the order of the Commission of October 14, 1924, it had its inception in part in the filing of new schedules by the company providing for increased rates and in part by the Commission's independent investigation.

The combined cases were tried in compliance with the statutes as they existed prior to the passage of the Carpenter Act, amending the Pence Law (113 O. L., p. 16).

Under the provisions of Sections 499-9, *et seq.*, and 614-20, *et seq.*, all values have been fixed as of a day certain, to-wit June 30, 1925.

Under the sanction of Section 499-11 and authoritive decisions much evidence has been introduced on behalf of the utility and of the State as to extensions, improvement and other changes in the condition and value of the property for each successive year subsequent to June 30, 1925.

When a rate goes into effect by virtue of the provision of the statute, upon the filing of the bond, such rate cannot be altered until the Commission has found and fixed a different rate, thus precluding any alteration of the rate as the value of the property may change, due to additions and betterments. Logan Gas Company *v.* Public Utilities Commission of Ohio, 115 O. S. 107. City of Cleveland *v.* Public Utilities Commission of Ohio, 126 O. S. 91.

The just and reasonable rate to be fixed by the Commission, as of a date certain in lieu of the schedule rate, may, however, be properly influenced not only by the condition that exists as of the day certain, but in consideration of predictable or experienced changes in order that the rate for a reasonable time may produce for the company a proper return upon its property used and useful.

This we must consider in compliance with the decisions of the Supreme Court of the United States to the effect that an honest and intelligent forecast of probable values made upon a review of all relevant circumstances is essential, and in every case the future as well as the present must be regarded to determine whether the rate is yielding or will yield a reasonable return upon the property at the time of investigation and for a reasonable time in the immediate future. See Bluefield Water Works *v.* P. S. C. of W. Va., 262 U. S. 679; McCardle *v.* Indianapolis Water Company, 272 U. S. 400.

In the Chicago case, the Supreme Court said:

> "It is the duty of the Federal Court, in determining whether utility rates fixed by a state commission are confiscatory, to find the facts as to the property value, revenue and expenses of a utility during the interval between the issuance of the order and the date of the court trial, since an order confiscatory when made may subsequently become valid, and vice versa."

The recent case of Central Kentucky Natural Gas Company, Appellant, *v.* Railroad Commission of Kentucky, decided by the Supreme Court on December 1, 1933, furnishes further authority for the consideration of changes occurring subsequent to the date certain.

In view of these statutes and decisions, we are required to ascertain the value of the property as of the date certain and base the rate upon such value and upon the income and expenses of the company at that time, with the modification that we ascertain the value of the property in succeeding years with due consideration to price trends and consider revenues and expenses of those years in order that the rate fixed shall produce an income fair to both the rate payer and the company for a reasonable time in the immediate future, from the date certain.

It is probably true that this is more imperative in considering the question of confiscation in the Federal Court, than in the fixing of a rate by the commission, yet as the rate fixed by the Commission will finally be tested on the question of confiscation, that infirmity in a rate may be

avoided by following the rules by which the question of confiscation is tested.

PRICE TRENDS.

When we examine the condition of the company's property, both as to value and income, subsequent to June 30, 1925, we must take into consideration not only the net additions, but also changed conditions and price trends, that we may determine whether the rate, fixed at the day certain, produces a revenue sufficient to afford the company a just return for a reasonable time in the immediate future.

In the case of the Central Kentucky Natural Gas Company, Appellant, *v.* Railroad Commission of Kentucky, *supra*, the Supreme Court, in discussing the refusal of the Court below to take into account the effect of changed conditions said:

> "That restriction also necessarily excluded from consideration the profound changes in values, costs of service, consumption of commodity and reasonable return on invested capital which we judicially know took place during the period of more than five years, while the case was pending before the Commission and the Court."

In numerous cases, Courts have indicated that they may take judicial cognizance of the downward trend of prices during the years of the depression. We feel that the Commission may likewise take notice of such fact. If we did not do so, it might well happen that a rate fixed for 1925 upon the then value of the property would subsequently be inadequate to afford a just return if the additions and betterments were considered and price trends disregarded, but that this same rate would be sufficient over that term of years when due consideration is given to price trends decreasing the value of the property upon which the return must be earned. Sections 499-11 and 499-15, G. C., provide the method of ascertaining the facts. The Commission may resort to any information available to keep itself informed of extensions and improvements and *other changes* in the value of the property.

We have endeavored from such sources of information as are available to correctly measure the price trends of telephone property including Accounts 211 to 265, since the day certain. A study was made of the cost prices furnished by manufacturers of telephone equipment over the several years. The trend of land valuation was ascertained from examination of the tax value in communities where the company had its largest real estate holdings, confining such to urban property only. For building trends resort was had to prices indices of the *Engineering News Record*, a recognized magazine in the field of engineering construction. Labor trends were developed from the same sources. Resort was also had to the finding of the Statutory Court in the Chicago case and its study of price level of sales of the Western Electric Company. That Court was there dealing with December 31, 1920 as the date certain and considered the level of that date as 100%, whereas we are dealing with a price level subsequent to June 30, 1925. The trend in price for each year as compared to the preceding years, indicated in the Chicago decision, taking the level of December 31, 1920 as 100%; was 1921, —1.7%; 1922, —10.7%; 1923, +0.2%; 1924, —5.6%; 1925, —1.1%; 1926, —8.7%; 1927, —4.9%; 1928, —10.3%; 1929, —8.6%.

In the Chicago Case, the Court disallowed the advance of 10.2% in Western Electric prices as of November 1, 1930, but held that plaintiff was entitled to a maintenance of the 1930 price level during the years 1930, 1931 and 1932. In harmony with the decision of this Court, we hold that the price for 1931 and 1932 for Western Electric should not be increased.

It would appear that the Chicago Court in fixing its price trend considered only the price trend of Western Electric purchases, probably on the assumption that it was a correct index of the price trend of all telephone property. We, however, have thought it pertinent, as above indicated, to secure price trends of telephone properties from the sources we have indicated in addition to the price trend of the Western Electric which we have applied to equipment sold by that company. We are conscious that there may

be some errors in this computation of price trends, but we feel that we are well within the line of safety in that we have considered only price trends as affecting telephone property, and that such trends are largely built upon the prices of the Western Electric which have not declined to the extent of general commodity prices.

Taking the date certain, June 30, 1925, as 100% and considering the added equipment for each year as 100% as of the year of installation, our examination develops a composite trend applicable to the entire property, exclusive of right of way and working capital, as of the beginning of the respective years and related to the preceding year, as follows, 1926, 98.73%; 1927, 96.97%; 1928, 99.20%; 1929, 101.45%; 1930, 95.65%; 1931, 93.95%; 1932, 88.71%, and 1933, 102.96%. The figures supporting these percentages are too numerous to set out in detail but the manner in which the percentages have been applied to the value of the property for each year is shown in Appendix "B."

An interesting discussion of price trends will be found In re Chesapeake and Potomac Telephone Company, decided by The Public Service Commission of Maryland, November 28, 1933. This Commission considered numerous indices in arriving at its conclusion as to the price trend for the telephone company and exhibits a graph of various price trends and the composite trend arrived at.

When we plot the price trends found by us and compare our graph with that of the Maryland Commission and the graph of the price trends by the Chesapeake Company, we find that all are practically parallel until 1930. After that date our graph parallels that of the Maryland Commission, but indicates values practically an average of those claimed by the Telephone Company and found by the Maryland Commission.

The graph exhibited in the Maryland Commission's decision does not cover the year 1933. During 1933, we find an upward trend in both as to labor and material but a downward trend as to land value, the average of all property indicating a slight upward trend. (See graph, Appendix "N.")

Effect of the Company-Wide Case.

A short review of the "Company-Wide Case" may be pertinent.

The case, known as the Company-Wide Case, was instituted by the Commission on its own motion in October, 1924, for the determination of the property valuation, revenues, expenses and rates of The Ohio Bell Telephone Company for its service as a whole. At that time there were pending many so-called Robinson Law and Pence Law cases, involving the rates for separate exchanges, which had been made effective under bond as provided by those laws. Following that, additional Pence Law cases arose out of the filing by the company of new rates for other exchanges.

With the institution of the company-wide case, the Commission as then constituted determined not to proceed at that time with the separate Robinson Law and Pence Law cases, and the Commission's inquiry has ever since proceeded on the company-wide basis, without separate testimony as to the property value, rates, etc., for the Robinson and Pence Law cases. This course originally had and apparently ever since has had the approval of the City Attorneys interested in those cases, although the Telephone Company has always insisted upon the right to present, and has offered to present, separate testimony with respect to them.

The "date certain" of the inquiry in the company-wide case was June 30, 1925. For the subsequent years the cost of the net additions to the property has been shown.

In view of the holding of the Ohio Supreme Court in the recent case of The Columbus Gas & Fuel Company vs. Commission, No. 23864 (decided after the company-wide case had been submitted to the commission), that in fixing the rates of a public utility, the municipality is the entity, the question arises whether the Commission can lawfully decide the Robinson and Pence Law cases on the record in the company-wide case as it now stands, find the rates heretofore collected in those cases to be reasonable or unreasonable and order the refunder of any portion of the rates

which may be found to be unreasonable; or whether the Commission should now require or permit the Telephone Company to submit evidence of its property value, revenue and expenses for each of those cases separately.

The point has been raised that the Commission cannot fix a just rate for separate exchanges, whether same are involved in Pence Law Cases or not, by considering the value of the property en masse, and that therefore it is without the necessary information to fix a just rate for each exchange as distinguished from a rate based upon the value of the entire property.

Grouping Exchanges of the Company.

The Company divided its exchanges into twelve groups and fixed rates for the several services including business, residence and switchboard. Within each group there are varying charges presumably dependent upon the value of the property as well as upon the cost of the service rendered. This matter has been worked out with great care by the Company and we must assume that the charges for the several services, before the protested advances, within each group and within the exchanges attached to each group were substantially based upon the value of the property used and useful to furnish service to the subscriber.

The Ohio Bell Company operates 163 exchanges, large and small, throughout the territory served by it which includes, together with its connecting companies, the entire State of Ohio excepting Hamilton and Clermont Counties and a portion of Warren and Butler Counties. It has connection with over 300 separate telephone companies in Ohio, not Bell owned. Of the 163 exchanges, 46 are involved in rate proceedings under the Pence Law, the advanced rates of which are now being collected under bond. The rates of the balance are being investigated, but not under the Pence law.

Number of Company Stations.

The Company, through its exchanges, served stations as follows: June 30, 1925, 520,604; June 30, 1930, the year in

which largest number was reached, 717,832; April 30, 1930, the month in which largest number was reached, 721,832; June 30, 1931, 700,330; June 30, 1932, 633,385; June 30, 1933, 529,301; December 31, 1933, 531,426. During 1932 and 1933 there was a severe loss of stations, with a slight recovery during the last six months of 1933.

Exact agreements between rates in municipalities having substantially the same population cannot be expected because there will be a difference in costs due to varying requirements of construction. The size of several communities and the telephone development may be similar, but one community may be limited in its service to its own boundaries while another may have free service to nearby places. Costs of both the construction and service in communities of comparable population may vary and economic differences between the subscribers living in such communities may justify slightly different rates. All services furnished within the City of Cleveland are measured and the rates for suburban Cleveland are fixed in varying amounts dependent upon the class of service rendered.

It is the judgment of the Commission that the company's rates as fixed for each exchange before advanced rates were scheduled, represent a balanced consistent rate structure for the entire territory without unreasonable inequalities as between the rates of the several exchange areas, and are reasonably in harmony with the value of the property used in each exchange. If we were to attempt to determine a separate rate for each exchange upon the appraised value of the property used at that exchange, we would be led into an intolerable lengthening of this case without any assurance that the rate that might thus be established would in any substantial way vary from the relative rates worked out by the company in its group system. This is in harmony with the views expressed by the various legal representatives of the several municipalities as evidenced in a joint meeting with the Commission April 18, 1933, R-5682-5726, especially 5717 and 5721.

In a news dispatch from Cleveland under date of April 20, 1933, widely published throughout the State of Ohio, Mr. Randolph Eide, President of the Ohio Bell Telephone

Company, is reported to have said in commenting upon the meeting of the City Solicitors—

> "Rates for telephone service have been under investigation as a whole on a company-wide basis since 1924. To begin now revaluing the company's property devoted to service to the public exchanges would incur a large expense, both to the company and the municipalities, and would result in additional years of delay in final determination of the case.
>
> Rates in general bear a reasonable relation as between the various grades of service in the community and as between exchanges of the same size and characteristics.
>
> It would appear that the suggestion at Tuesday's meeting of the commissioners and city representatives to value the company's property as a whole to determine whether the rates represent a well-balanced schedule as between classes of exchanges and as between exchanges of the same class, affords an opportunity to work out a solution to the problem. The company always has been willing to co-operate along reasonable lines and will continue to do so in the present instance."

In speaking editorially of the suggestion of fixing the rate for each individual community, on the basis of valuation, expenses and revenues, a leading Ohio metropolitan paper pertinently said:

> "Unless the Commission can get the money to continue to employ an army of public accountants, it is estimated that four or five years more would be necessary to break down the valuations, expenses and revenues to apply to each municipality. To set rates by classification on the basis of state-wide figures, would be a much speedier process, perhaps could be accomplished in four or five months."

At the meeting of the City Solicitors, on April 18, 1933, the Chairman of this Commission reviewed in detail the situation arising out of the company-wide case.

THE COMPANY ESTOPPED.

The Company has at intervals asserted that it reserved its right to test the justness of the rate for each exchange by a separate determination of the value of the property and net income of each by the usual methods pursued in rate cases. The last communication of the company to this effect is dated December 22, 1933, wherein it referred to reservations of its right to offer evidence in the separate cases of the property value, revenues and expenses for the period under investigation for all the Robinson and Pence Law cases separately. The letter of December 22nd, concludes:

> "The Ohio Bell Telephone Company now renews its offer, above referred to, insists upon its right to submit the evidence so offered, and requests that the Commission set a date on which the introduction of the evidence may be commenced."

To follow the suggestion made by the Company would be to nullify most of the work done in this case since the consolidation in October, 1924, of all the then pending cases into the company-wide case. There has been a definite recognition of the propriety of a company-wide method of fixing rates by the Commission, the Legislature and by all parties, except as the Company asserted a reservation, and to halt the determination of this case now and turn back to the situation that existed in 1924, and begin the trial of each Pence Law case separately, would be intolerable. The case must proceed to a conclusion along the route then mapped out and since followed at a great expenditure of time and money.

The reservation of a right as now asserted by the Company is not in harmony with its participation in company-wide valuation. If the Company was not willing to submit to the Order of Consolidation of October, 1924, it should have taken exceptions at that time and had a court review the legality of the order of the Commission. It is too late now to complain of a method in which it seemingly acquiesced, even though it asserted a reservation. We think the

Company is estopped by its actions during the long trial of the Company-wide case.

The Law.

We are not unmindful of the holding of the Supreme Court in the Columbus Gas case that the unit established by the Ohio constitution for dealing with public utility service is the municipality, and not the utility. We do not attempt to avoid this principle, but we do find that under the method pursued in the trial of this case we are fully justified in fixing the rate to be paid in each municipality upon the several relative valuations recognized by the Company when it originally grouped its exchanges and established rates for the several services furnished by each, before the advances which led to the protests now under investigation.

We are not without precedent and authority upon this matter. In its order (P. U. R., 1924 A-1, at page 9) the Indiana Commission referring to Company-wide rate fixation, very similar to the situation in the present case, said:

> "The fixing of rates is a matter which involves considerations other than the matter of revenues and expenses and it is quite practicable that rates be fixed that will be just and reasonable to all subscribers by a grouping of exchanges of like character and the application of a certain schedule of rates to all the exchanges in that group rather than by an attempt to fix the rates for each exchange separately. The policy of consolidating the whole Indiana Bell Telephone rate investigation into one order and considering it as one unit has been adopted by several other states and has been found to be very much more satisfactory to the public, and to the utility."

In Wabash Valley Electric Company *v.* Young, 287 U. S., 488, 77 L. ed., 348, the Supreme Court said:

> "Normally, the unit for rate making purposes, we may assume, would be the entire interconnected operating property of a utility used and useful for the convenience of the public in the territory served, without

regard to particular groups of consumers or local subdivisions. But conditions may be such as to require or permit the fixing of a smaller unit."

See also—In re: Uniform Telephone Rates in Pennsylvania, P. U. R., 1917 D, 259; In re: Mountain States Telephone and Telegraph Co., P. U. R., 1917 B, 277; In re: Indiana Bell Telephone Company, P. U. R., 1924 A-I, p. 9.

Under the circumstances, we are of the view that we cannot accede to the request of the Company as indicated in its letter of December 22, 1933.

Conclusion as to Valuation.

After re-examination of the former finding of this Commission, we now find that the value of the property of The Ohio Bell Telephone Company, as a plant in actual and successful operation, used and useful in the service of the public in all the exchanges of said company, within the State of Ohio, and in intrastate toll service, upon a reproduction new less depreciation basis, as of June 30, 1925, was $93,707,488.

The difference between the Tentative Valuation heretofore found, and the Final Valuation herein fixed, is as follows:

Tentative Valuation, Finding January 10, 1931		$104,282,735
Deductions—		
Allocation to Interstate Service	$2,714,788	
Right of Way reduced to book value	325,247	
Undistributed Construction Expenditures reduced	3,391,674	
Separate Item Going Concern Value	3,592,040	
Working Capital including Materials and Supplies reduced	551,498	
Total Deductions		10,575,247
Final Valuation per Appendix "A"		$93,707,488

Considering additions and betterments and price trends we find the value of such intrastate property was, as of dates subsequent to June 30, 1925, as follows: 1926, $101,767,774; 1927, $111,036,522; 1928, $122,417,735; 1929, $134,765,576; 1930, $145,683,047; 1931, $145,271,663; 1932, $133,625,655; 1933, $126,250,206, an average, for the nine years under consideration, of $123,836,185.

The detailed tabulation of these figures will appear in Appendices "A" and "B". Supporting detail upon which the valuation is based will be further found in Appendices "C", "D" and "E", all of which are made a part of this finding.

All protests filed by either the Company or by the Attorney General on behalf of the telephone users of the State of Ohio or by the several legal representatives of municipalities, touching the valuation of the property, not in harmony with this finding, are hereby overruled.

Revenue and Expense.

Observations on Relative Importance of Rate Base and Expenses.

Having found the value of the property of the company used and useful in the service of its patrons, we enter upon the study of the income derived from the property and the expense of its operations.

Some general comment may properly be made as to the relative importance of the two distinct problems, valuation and net income, which jointly control the proper rate ultimately to be charged for service.

Apparently during the whole course of this proceeding, the valuation has been over-emphasized and years have been consumed on this problem with relatively slight attention paid by the parties to the investigation of revenue and expenses. This seems to be common to most rate cases.

This over-emphasis will appear when we realize that the rate to be charged the consumer should be such as to produce a fair return upon the value of the property. This return is but a percent of the value. Assuming that we hold that the company is entitled to a net return of 7%

upon the value of its property, every million dollars of value will affect the rate payers only to the extent of $70,000 annually, which when related to the number of rate payers in peak years, is less than ten cents per year for each, although a substantial sum for the Company. However, every dollar of expense must be produced by the rate-payer, so that every dollar charged by the company for its operation or as a reserve, becomes a dollar in which the rate payer is one hundred percent interested. Based upon a 7% rate of return, each dollar of revenue and expense has over fourteen times as much weight in the ultimate result as any dollar of valuation. The rate payer and the company, therefore, are deeply concerned whether or not expenses have been improperly charged either as to the character or amount.

We therefore approach the analysis of certain of the expenses asserted by the company and the allowance to be made for them with full realization of their importance, both to the rate payer and to the company.

Income.

We assume that the gross *income* as presented by the company in its various exhibits is correct, as accurately reflected from the books of the company. No claim has been made by the State that the books have been inaccurately kept so far as they reflect the gross income. This appears on Appendix "F."

Expense of Depreciation.

The Commission is charged under the statute with the duty of making reservation out of the income for surplus, depreciation and contingencies, and all such other matters as may be proper according to the facts in each case.

Sections 614-49 and 50 provide that the Commission shall ascertain, determine and prescribe what are proper and adequate charges for depreciation, which shall be such as will provide the amount required over and above the cost and expense of maintenance to keep the property of the public utility in a state of efficiency corresponding to the

progress of the art or industry; the amount so determined to be used for the purpose of renewing, restoring, replacing or substituting depreciated property in order to keep the plant in a state of efficiency.

It has always been one of the perplexing problems of rate making to determine the proper annual allowance, expressed in terms of percentage, for depreciation. This item should be, and is, as capable of exact determination and calculation as is the determination of a proper rate of return. A utility is entitled to earn a fair return upon its investment, as represented by its property used and useful for the convenience of the public, and in addition is entitled to maintain said property in a state of efficiency corresponding to the progress of the art or industry. To so maintain its property, a utility is permitted to earn a certain fixed sum annually for depreciation in addition to the net rate of return. As this depreciation reserve is earned it should replace deteriorated, obsolete and useless items in the capital account to keep the property in the statutory state of efficiency. Therefore, it has been contended by some that the accumulated depreciation reserve should be deducted from the capital account in determining the rate base; that to handle this item otherwise is to permit the utility to earn twice on substantially the same item. However, this contended for method or practice is not the rule in Ohio, and we are bound by the decision of our Supreme Court in the case of Cincinnati *v.* Public Utilities Commission, 113 O. S. 259, wherein it is declared where there is a reserve depreciation account in excess of the actual depreciation found, such excess cannot be deducted from the present reproductive cost.

An important factor in determining the proper depreciation allowance, is the maintenance policy of the company under consideration. This company has from the time of the merger in 1921 carried on a high standard of maintenance and kept its property in good condition and in a high state of efficiency. The line of demarcation between maintenance charge and depreciation charge is often quite dim and undoubtedly many items properly chargeable to reserve are handled as maintenance expense.

Charges that would be considered a major requirement to a smaller utility are merely routine maintenance matter to a utility of the size of the present company.

This Commission found at the time of fixing a tentative valuation of the property that the depreciable property of this Company was on the date certain in a 87% condition. To maintain that condition the company expended from the time of the merger to the date certain in the way of expenses for current maintenance and repairs the sum of $16,385,139.00 and during the same period the net charges to reserve for depreciation amounted to $11,349,664.00. From the date certain to December 31, 1931 the company paid out in the way of expense for curent maintenance and repairs the sum of $42,064,639.00 (a very liberal sum), and its net charges to reserve for depreciation for the same period were $40,956,301.00.

We are especially concerned with the practice of the company in maintaining its property as of the date certain and for the years prior thereto for the reason that the value of the plant as of the date certain is the base upon which the return to the company is computed.

In addition to making the expenditures for maintenance and net charges to the reserve for depreciation as above mentioned, the company at June 30, 1925, the date certain, had accumulated and carried a depreciation reserve balance of $12,560,502.79 divided as follows—Reserve for Accrued Depreciation $12,330,762.95, and Reserve for Amortization of Intangible Capital $229,739.84. As of December 31, 1932, the company showed in its statement to this Commission a reserve for accrued depreciation and amortization of intangible capital amounting to $20,569,893.70, of which sum approximately $306,000.00 is the reserve for amortization of intangible capital.

The balance in the reserve on the date certain represents past accumulations for depreciation after deducting the actual retirements from year to year. These accumulations had been made by annual charges to operating expenses, i.e., by annual segregations of the revenues paid by subscribers for service received. Each year's reservation rep-

resents the company's estimate of the depreciation of its property in that year in serving subscribers, and the net accumulations in the reserve show what payments by subscribers set aside for this purpose are not yet needed, in the company's judgment, for physical retirement of property. In other words, the balance in the reserve shows the accumulated amount set aside to replace depreciated property in the future which customers have paid for in advance of writing the property out of the property and plant accounts.

There is a definite relation between past accumulations from reserves and proper allowance for the future. In the case of Smith *v.* Illinois Bell Telephone Company, 282 U. S., 133, it was held—

> "The allowance for depreciation entering into the ascertainment of the rate base of a public utility may be based on past experience, and should not be continued if shown by such experience to be excessive."
>
> "Results shown under comparable conditions by other utility companies similarly situated, together with past experiences of the company in question, should afford a sound basis for judgment as to the amount which should be allowed as an annual charge for depreciation in fiixing a rate base."

In the opinion in said case the Court further says—

> "While it has been held by this court that property paid for out of moneys received for past services belongs to the company, and that the property represented by the credit balance in the reserve for depreciation cannot be used to support the imposition of a confiscatory rate • • • it is evident that past experience is an indication of the company's requirements for the future. • • • The experience of the company should afford a sound basis for judgment as to the amount which, in fairness both to the public and private interest, should be allowed as an annual charge for depreciation."

We believe that there is a direct relationship between the condition percent of a public utility property and its history as to retirements on the one hand, and the allowance that should be made annually for depreciation on the other. As heretofore stated, the property of the company on the date certain was in a 87% condition.

From the books of the company (Wood Exhibits 12-13 and 15) we find that from the date of merger, September 21, 1921, to the date certain, June 30, 1925, the company made net charges to its depreciation and amortization reserves for various types of property, equal to the following average annual rates.

Depreciation—	
Telephone Plant and Equipment including Office Furniture and Fixtures	3.74%
General Store Equipment	.19%
General Stable and Garage Equipment	16.78%
General Tools and Implements	4.93%
Amortization—	
Right of Way	2.49%

During the same period the company credited its depreciation reserve with amounts equal to the following average annual rates:

Depreciation—	
Telephone Plant and Equipment including Office Furniture and Fixtures	5.50%
General Store Equipment	9.96%
General Stable and Garage Equipment	19.69%
General Tools and Implements	19.79%
Amortization—	
Right of Way	4.39%

Charges equal to the above reserve credits were entered in the company's books as follows:

Charged entirely to expenses—

Depreciation of Telephone Plant and Equipment including Office Furniture and Fixtures	5.50%
Amortization of Right of Way	4.39%

Charged partly to Expenses and partly to Fixed Capital, according to use—

Depreciation on General Store Equipment	9.96%
Depreciation on General Stable and Garage Equipment	19.69%
Depreciation on General Tools and Implements	19.79%

Due to the rapidly depreciating nature of the last three classes of property, the apparent fairness of the rates used, and the relatively small portion of the valuation represented thereby, the Commission does not criticize the depreciation shown by the books for these items. Amounts for Amortization of Right of Way must hereafter be entirely disallowed by the Commission in compliance with the ruling of the Ohio Supreme Court in the case of Columbus Gas & Fuel Company *v.* Public Utilities Commission, 127 O. S. 109.

As the major item of depreciation expense is represented by the amount charged for depreciation on telephone plant and equipment including office furniture and fixtures, it appears that from the date of merger to the date certain the company annually charged as depreciation expense an average composite rate of 5.50% and that its net charges to reserve for depreciation during the same period was equal to an annual composite rate of 3.74%.

It also appears that the company's charges to expense for depreciation for the years subsequent to the date certain were somewhat higher than for the preceding years, averaging 5.60% to the end of 1931. It also appears from the record and books of the company (Wood Exhibit No. 16) that the company made a reduction in its composite rate for depreciation which on December 31, 1931, amounted to 5.8%, to 4.4% as applied July 1, 1932, a net reduction of 1.4% representing a reduction of 24% in its annual rate for depreciation expense, a recognition on the part of the

company that the reserve for depreciation was accumulating in excess of the actual needs of the company and condition of its property to keep the property of the utility in a state of efficiency corresponding to the progress of the art or industry. The company gave similar recognition to changing depreciation requirements by revising its depreciation rates as of January 1, 1922, August 1, 1926, and January 1, 1929.

There have been extensive changes in the fixed capital of the company during the years prior to 1928 as well as the years thereafter due to new construction and retirements of old plant, resulting in the substantial reconstruction of the plant of the company and in the modernization thereof to such an extent as to require comparatively few replacements for some time to come. At the time of the merger, September 21, 1921, the balance in the fixed capital account as shown by the books of the company was $75,269,253. During the years following that date and including the year 1927 the company increased its fixed capital amount, according to its books, to $128,735,984 of which $95,616,505 represented gross additions, from which it readily appears that new construction and purchases equal in money value the fixed capital at September 21, 1921, was completed some time during the year 1927. Up to December 31, 1931, the book value of gross additions amounted to $184,971,637 and gross deductions to $88,419,086, disclosing also that the entire money value of the fixed capital at September 21, 1921 became fully retired some time during the year 1931. The gross deductions at the end of the year 1930 amounted to $74,674,366, being within $600,000 of the entire money value of the fixed capital at September 21, 1921.

A summing up of the foregoing proimpts us to conclude that for maintenance of the property in the percent condition as found by this Commission as of the date certain, the practice of the company demonstrated that a composite rate of 3.74% of the depreciable property expended annually for depreciation was amply sufficient, and considering also the large sums expended by the company for the years prior to and subsequent to the date certain for maintenance and repair, and that the plant has been substan-

tially reconstructed and fully modernized, that in order to allow for annual statutory depreciations both realized and unobserved, a composite rate of 4% of the depreciable property is a fair and just allowance to be made annually for depreciation expense, and it is our conclusion and finding that said rate be fixed and allowed in this case to be computed on the present value of the depreciable property as of the date certain, and for years subsequent to the year 1925 to be computed upon the present value of said property as of the date certain plus net additions to the depreciable property. The value of the depreciable property of the company as of the date certain having been found to be $84,330,894, the amount to be allowed for depreciation expense for the year 1925 is hereby determined and fixed at $3,373,236. This allowance to be allocated between interstate and intrastate operations per Appendix "F." The respective allowances for depreciation expenses for subsequent years, computed on the basis herein determined, are set forth in Appendix "K" hereto attached.

Comments on the License Contract.

Important issues are raised in the consideration of the license contract existing between the American Telephone & Telegraph Company (licensor) and the Ohio Bell Telephone Company (licensee) by which the former was to furnish to the latter certain appliances and render certain specified services.

The contract in force at the date certain was entered into between the several parties on October 16, 1923. Briefly, it provided that the licensor granted to the licensee, license to use its patented receivers, transmitters and induction coils (telephones) and in addition thereto was obligated to furnish to the Ohio Company certain engineering, financial and advisory services, for all of which benefits the licensee agreed to pay to the licensor 4½% of its total gross earnings payable in monthly installments and computed as provided for in the contract. On January 1, 1926, this percentage was reduced to 4%. Effective January 1, 1928, the license contract was again modified by providing for the sale by the American Company to the Bell Company of the

patented articles furnished under the original license contract, the Bell Company assuming the obligation to replace and repair the instruments. The royalty contract was changed so that the Bell Company paid only 2% of the gross revenues thereafter until January 1, 1929, when the payment was further reduced to 1½%.

The fact that the license contract provided for the furnishing of instruments and service at the date certain and was later modified so as to exclude the rental of the instruments and include only the service, makes it necessary to give it a different effect in the several years.

In the Illinois Telephone case the Supreme Court said in substance that specific findings should be made with regard to the cost of the services rendered and instruments furnished by a parent company to an operating telephone company under a license contract, and as to the reasonable amount which should be allocated to the operating expenses of the intrastate business of the utility in determining whether rates are confiscatory.

Chief Justice Hughes said—

> "In view of the findings, both of the State Commission and of the Court, we see no reason to doubt that valuable services were rendered by the American Company, but there should be specific findings by the statutory court with regard to the cost of these services to the American Company and the reasonable amount which should be allocated in this respect to the operating expenses of the intrastate business of the Illinois Company in the years covered by the decree."

The Findings of the Statutory Court.

The Statutory Court in compliance with the instruction of the Supreme Court has made certain findings as to the cost to the parent company of this service as covered by its specific findings 22 to 26 inclusive.

We have carefully studied the opinion of the Statutory Court and the evidence adduced in its support and the evidence adduced by the State in the instant case. We have the highest regard for the findings of this Court and recognize the fact that it had before it the witnesses who testified

to various items touching the cost of this service, and we regret that we cannot follow in its determination of the cost to the American Company for services furnished by it under the license contract.

Rental of Instruments.

As to the rental of the instruments, we are not in harmony with the Court as to the cost of this service to the American Company especially on the item of 7% depreciation in Ohio. It appears from the evidence that the American Company charged the licensees 7% depreciation as a part of the cost of its service, but when it sold the instruments to the licensees such depreciated value was disregarded and a profit of $14,395,800 was realized for all such instruments so sold. In computing the cost to the American Company for furnishing the instruments we have reduced the revised 6% depreciation made by the company after the Chicago decision, to 3% as amply sufficient to cover this item in view of the sale price of the property. The $14,395,800 realized as a profit in this sale was placed in the surplus fund of the American Company designated in this case as a reserve for contingencies and asserted to be for the purpose of protecting the licensee companies against patent infringement liability. There is no evidence in the record of any expense being incurred during any year on account of such liability.

The License Agreement.

The contract provides that the licensee is entitled to receive from the licensor in addition to all other services and benefits accruing to the licensee, the described services and privileges which may be briefly summarized—

(a) The right to use all telephonic devices covered by patents owned by the licensor and all new improved apparatus in the art of telephony resulting from experimental work under the direction of the licensor, and protection against all suits for infringement.

(b) The continuous prosecution by the licensor of research work in the development of the art and the plans

designed to promote economy and efficiency in equipment of the plant of the associated companies.

(c) Advice in engineering, traffic, operating, commercial, accounting, patents, legal, administrative and other matters pertaining to the successful conduct of the telephone business.

(d) Advice and assistance in any financing required to be done by the licensee in the extension of its plant or improvement to its system, and assistance in marketing licensee securities and other necessary financial support.

(e) The right to extend to subscribers of the licensee the connections provided between its system and the system of other associated companies and their subscribers.

(f) Active assistance in connection with such measures as will best protect the health of employees and in other ways conserve the high quality of service and maintenance by the licensor of various pension and insurance plans.

(g) The right of the licensee to extend to its connecting companies the benefit of the advice and information that the licensee may receive from the licensor.

In order that the services may be promptly performed, the licensor will—

(a) Render available for use of the Bell Company all products of the licensor's research and all inventions, etc., relating to the art of telephony, which, after investigation, are pronounced by the technical experts of the licensor to be of practical use.

(b) Maintain continuously an organization of specialists to relieve the licensee from the necessity of performing such work.

(c) Maintain facilities for connection between the system of the licensee and the system of other associated companies.

The contract provides for full service between the exchange of the licensee and the toll lines of the licensor setting out provisions for payment of interline service.

Field Occupied by the American Telephone & Telegraph Company.

It is impossible to determine with any correctness the value and cost of the service rendered by the American Company to its Bell subsidiaries unless we comprehend the wide field occupied by this company.

The American Company owns directly or indirectly more than 90% of the combined voting stock of the 24 companies associated with it as the Bell system, together with the long distance lines which connect the wires of the different companies. The Bell system forms an inter-communicating system of nearly fourteen million telephones with which are connected the lines of nearly seven thousand other companies and more than twenty-six thousand rural lines covering the entire United States. Service is provided to Canada, Cuba and New Mexico by wires and by radio telephone to most of the countries of Europe, South America, South Africa and the islands of the sea so that 92% of the entire telephones of the world can be reached by the Bell system.

In 1931 the company introduced the use of the teletype writer, a valuable adjunct to the newspaper service.

The company owns 98% of the stock of the Western Electric Company, 50% of the Bell Telephone Laboratories by direct ownership and practically the remaining 50% through its ownership of the Western Electric; all of the stock of the Bell Telephone Securities Company, the Eastern Telephone and Telegraph Company of Canada and 50% of the stock of the Cuban Company.

The Bell Telephone Company of Canada, of which stock the American Company owns 24%, owns and operates toll lines and telephone exchanges in Quebec and Ontario. Through the Cuban Company it owns certain valuable concessions and rights in Cuba and has submarine cables to that island.

Western Electric Company.

This company manufactures and distributes telephones and other electrical apparatus mostly to the Bell system. It is also the purchasing agent for that system. Its largest

manufacturing plant is at Hawthorne, Illinois, with at least two other important plants. This company formerly conducted foreign business which in 1925 it sold at a large profit. Its present territory now corresponds to that of the Bell system. Upon the sale in 1927 by the Western Electric of its foreign business a cash dividend of $48,000,000.00 was received by the American Company, which was added to the surplus of the company.

Certain other companies, such as the Graybar Electric Company, were organized as fully owned subsidiaries of the Western Electric, but have since been sold.

The Bell Telephone Laboratories.

The American Company and the Western Electric own jointly the Bell Telephone Laboratories, it being nearly all owned by the American Company through its ownership of the stock of the Western Electric. This company took over all the research and development functions formerly performed by the Western Electric.

The inventions of the Telephone Laboratories have contributed to the progress of electrical science outside the strictly telephone field. To make these developments available in such other fields the Electrical Research Products Inc. was organized in 1926, wholly owned by the Western Electric and through it by the American Company. Non-telephone activities were thus given special attention without conflict with the telephone work. Such activities relate to submarine cables, phonographs, talking motion pictures and many other activities.

In 1930 the American Company acquired the Teletype Corporation now operating as a subsidiary of the Western Electric. The American Company also owns the Bell Securities Company to facilitate transactions in Bell Telephone securities.

Sale of Telephone Instruments.

In 1927 the American Company sold to the associated companies the telephone instruments formerly maintained by it and reduced its license fee as heretofore stated.

Other Non-Telephone Operations.

The American Company has other contracts with telephone companies and is engaged in the development of the use of telephone wires for broadcasting and has developed short wave transmitting telephone stations for foreign service and for communication with airplanes and with ships at sea. The company through its research activities has secured patents covering inventions of its research laboratories in the field of radio and has recently turned over to the Radio Corporation of America the right to manufacture and distribute radio equipment utilizing such inventions. It has also been active through its laboratories in the development of the art of television and telephoto and has engaged in many other activities reaching out and developing new sources of profit not connected with telephone business.

The American Company has recently submitted to the tax authorities of the State of Ohio its statement of the service covered by its license contract and has stressed the fact that practically all the information that it gathers through its research laboratories is transmitted to the associated companies within the several states by bulletins, pamphlets and letters, stating specifically that it is not customary for any of its operating force located in New York to visit the fields for actual contact with the operation of the plants within this State. They will, of course, if occasion requires, send men into the field.

The balance sheet of the American Telephone & Telegraph Company for 1925 shows total assets of $1,645,565,373.91 of which only $1,027,448,629.48 is its investment in the stocks of the associated telephone companies, leaving more than $600,000,000.00 as representing other assets than its interest in the associated operating companies, or approximately 62% of its assets represented by its holdings in its associate Bell companies and 38% representing other assets.

License Contract Costs.

The business of The American Telephone and Telegraph Company is carried on by thirteen separate and distinct

departments. One department known as the Long Lines Department is not claimed to have rendered any service under the license contract and hence has no part in this proceeding. The remaining twelve departments, each of which the Ohio Bell Company claims to have rendered service of benefit to it under the license contract, are the following: (1) Operation and Engineering; (2) Development and Research; (3) Information; (4) Personnel; (5) Public Relations; (6) Treasurer; (7) Comptroller; (8) Secretary; (9) Administration (Incl. Sundry Items); (10) General Service Bureau; (11) Department of Operation—C (General) and (12) Legal.

Each of these twelve departments kept separate record and account of its own expenditures and the purpose thereof, but no attempt has at any time been made to designate what portion of the annual expenditures was strictly license contract expenditure and what was not, and it devolved upon the officers and witnesses for the company to separate such expenditures between license contract expenditures and non-license contract expenditures for the purpose of this case according to their judgment.

While numerous court decisions have in the past sustained license contract payments to the American Company in the sums fixed by the contract as proper operating expenses of the Associate companies, those decisions must be considered in the light of the recent decision of the Supreme Court in the Illinois Telephone Company case heretofore cited, and it is our conclusion that said court in its decision intends that the payments by the telephone company to the American Company for license contract services be restricted to the actual cost to the American Company of benefits conferred upon the operating company or to the amount charged therefor whichever is the lower. This requires us to ascertain the actual cost and the nature and character of the services rendered, and allow as operating expenses only for such services as are essential and beneficial to the Ohio Bell Telephone Company in the operation of the utility. The rate payer is not required to pay for something which is not of actual service or benefit to the utility in rendering its service to the public. We,

therefore, feel constrained to inquire into the various items of expenditure of the operating company under the license contract. We have disallowed many of the items, as will hereinafter appear, either because the scope of the work and service were in the interest of and for the sole benefit of the holding company rather than for the licensee company, or that the particular service of the American Company was not rendered for the Ohio Bell Telephone Company even though such service may have been of service or benefit to other companies of the Bell System or other affiliates of the A. T. T. Co.

The Company has submitted as part of its evidence what it claims to have been the cost to the American Company of rendering license contract service by each of the twelve departments for the respective years 1925 to 1931 inclusive. The figures for the respective years so claimed by the company are shown upon Appendix "J" hereto attached. The Company then in turn allocated said operating expenses to the Ohio Bell Telephone Company as is shown in said Appendix "J."

(1) Department of Operation and Engineering.

The functions of this department consist entirely of rendering service to the operating telephone units of the Bell System. The State admits these services are of value to the Bell Company and concedes the entire claim of the company. We are disposed to and do allow the amounts as claimed in full.

(2) Department of Development and Research.

It is claimed by the company that this department conducts fundamental research in the field of electrical communication to the end of producing improved instrumentalities for giving communication service; and that it is the further function of this department to prepare the fundamental requirements for the installation, operation and maintenance of new equipment.

The State admits that this department does much to benefit the associated companies, but we are of the opinion that numerous expenses and costs claimed are not related

to Ohio Bell Telephone operations and do not constitute a proper charge under the license contract. This appears self evident from the nature of the service for which the expenditures are made. We are disposed to and do eliminate and disallow all costs and expenses incident to the following services and items: picture transmission, television, radio and submarine cable telephone connecting equipment and circuits, radio transmission systems, vacuum tubes, photo electric cells and submarine cables. These items and amounts charged for each, appear in Exhibit A-118-B. The amounts disallowed for the year 1925 and subsequent years to 1931 inclusive are set forth in Appendix "I" hereto attached.

The remainder of the costs claimed by the company in the Department of Development and Research will be allowed as proper license contract expenses.

(3) Information Department.

It is the claim of the Company that the Information Department advises the associate companies with respect to their own publicity and that it conducts general publicity in their interest, and that the expenses of the Department are for advertising space, payment for printed matter, booklets, etc., salaries and incidental expenses and that by far the greater part of the expense of this department is for advertising. It appears to us that this advertising does not relate to the Ohio Bell Telephone Company as such; that much of it relates solely to the A. T. & T. Co., some to the Western Electric and to the Bell Telephone Laboratories work. Considering also that the Ohio Bell Company pays its advertising bills as a part of its general operating expenses, we do not consider that the general advertising of the A. T. & T. Co., national in scope, should be paid by the Ohio rate payer and therefore we disallow all of the costs claimed for the Information Department.

(4) Personnel Department.

It appears to us that the scope of the work of this Department is rather in the interest of the holding company than that of the licensee and the cost thereof not proper

charges against the rate payer of the operating company, but considering that the State has admitted the propriety of some of the items and objected to others, we are disposed to adopt the State's figures and disallow those items set forth by the State in Appendix D of its brief consisting of the following: special training A. T. & T. Co. employees, "other" items shown in Column 4 Exhibit A-150-B, Public Relations, "other" items shown in Column 4 Exhibit A-151-B and interest on employees' benefit fund, Exhibit Heiss No. 10. Supl.

The items so disallowed for the years 1925 to 1931 inclusive are set forth in Appendix "I" hereto attached. The remaining items of cost in the Personnel Department will be allowed as claimed.

(5) Public Relations Department.

Mr. Heiss, witness for the Company, testified:

> "The Department of Public Relations represents companies of the system before the federal government, also in work with national trade and industrial organizations. This representation is given both on matters which are of general interest to companies and on matters which, while affecting only some particular company, may sooner or later benefit others."

There is no evidence that any work of this Department was specifically rendered or of service to the Ohio Bell Telephone Company and we do not believe that any part of the cost of this Department should be paid by the Ohio rate payer and therefore the total amount claimed for the Public Relations Department is disallowed.

(6) Treasurer's Department.

It is claimed by the company that the function of this Department is the custody of the cash and securities of the company; receiving and disbursing its funds including the payment of payrolls and expenses; the making of advances to the associate companies; investing the surplus cash on hand in short time securities; to issue, transfer and register the securities of the company including the issue to the

employees of stock under the employees' stock plan, and conduct financial research and to develop methods for improving practices in its own office and in the offices of the associate companies' treasurers; in personal consultations and correspondence with the treasurers of the associate companies and their offices on specific questions.

The costs of this department are divided into six groups as follows:

1. Cost of handling new security issues.
2. Cost of servicing outstanding securities of the A. T. & T. Co.
3. Cost of handling and making advances sought by associated companies.
4. Cost of financing general department of A. T. & T. Company.
5. Cost of handling employees stock plant.
6. Cost of advising associated company and long lines in their treasury work.

It appears to us that [redacted] of this Department, with [redacted] are entirely for the benefit of the A. T. & T. Com[redacted] not proper charges against the operating company and we therefore disallow all items charged for under the following items: direct distribution of securities, servicing securities, handling funds and making advances, financing general department and handling employees' stock plan, all as appear in Exhibit III, N. R. 861-864-863 and 862. These various items are set forth in detail in Appendix "I" attached hereto. The balance of the cost claimed by the Company in said Department will be allowed.

(7) Comptroller's Department.

This department deals largely with statistics, general books and records and reports and we are inclined to the view that these activities are rather those pertaining to the holding company than to the operating companies. However, the State concedes the propriety of some of the charges as proper items of expense and we therefore adopt the State's position in allowing part and disallowing other

items. The figures disallowed are those set forth in Appendix D of the State's brief consisting of the cost pertaining to the following functions of that department: general books and records, chief statistician, Bell system reports, and proportion of subheads "undistributed" and "administration" appearing in Exhibit A-155-B. The items so disallowed are shown on Appendix "I" hereto attached. All other items included in said Department cost consisting of Bell system methods, chief traveling auditor, chief accountant and proportion of sub-heads "undistributed" and "administration" are allowed. The items so allowed for the respective years appear in Appendix "H" hereto attached.

(8) Secretary's Department.

The duties of this Department have been testified to as consisting of the usual duties performed by any high type secretary.

It appears clear to us that the expenses of this Department should not be paid by the rate payer for the reason that the services are solely for the benefit of the holding company and not for the operating company and therefore all costs claimed for this Department will be disallowed.

(9 and 10) Administration Department and General Service Bureau.

The costs of the Administration Department pertain to the general administrative officers and of their assistants of the American Company, and the function of the General Service Bureau is to perform the work of the Company more or less common to all the departments where it is considered that the work may be handled more advantageously by a central organization.

It is claimed that if the General Service Bureau did not exist, the work performed by it for the various departments would have to be performed by each department separately and therefore add to the cost of service of other departments. It is also claimed that the general officers supervise the activities of the various departments and that therefore the cost of the Administration Department might

be logically spread among the different departments of the American Company and thereby add to the cost of the license service rendered to the operating company.

We recognize the force of these contentions and consider that part of the costs of the Administration Department and General Service Bureau should be borne by the operating company, but we are not disposed to allow the full amount claimed for the reason that we have not allowed the costs of operation of a number of the departments, and reduced the amount allowed in other departments. Therefore it would be unfair to allow all of the costs of these two departments. It is our conclusion that a proper amount to be allowed, in the absence of testimony to the contrary, is just one-half of the amount claimed by the company as the costs incident to the Administration Department and General Service Bureau. The amounts so allowed (and disallowed) for the various years 1925 to 1931 inclusive, appear in Appendix "H" hereto attached.

(11) Department of Operation—C (General).

This Department is said to furnish the associated companies with advice in matters pertaining to negotiations of purchases and sales of operating properties.

From the testimony of Mr. Heiss on this subject we are satisfied that these expenses are primarily for and directly intended to benefit the Western Electric Company and the American Company as a holding Company. For that reason we have decided to disallow all costs of this department.

(12) Legal Department.

We are not disposed to question the propriety of these costs and therefore have decided to allow the full amount claimed for this department, and shown on Appendix "H" hereto attached.

It might also be noted that the State at no time contradicted any of the items of expense of said departments, nor questioned the methods or ratios used or the amounts allocated to the Ohio Bell Company or to its intrastate business as presented by the company, nor did the State offer or advocate any other allocation of any of the items of ex-

pense. The objections on the part of the State, where made, were to the relevancy of the cost of items of expense for services not essential nor beneficial to the operations of the Ohio Bell Company.

Allowance and Disallowances of Departmental Costs and Expenses.

Summing up what has been said pertaining to the twelve departments aforesaid and in order to set forth the specific amounts allowed and disallowed there is attached hereto Appendix "H" to which reference is had to ascertain the total departmental expenses allowed for the years 1925 to 1931 inclusive, and appearing upon the same appendix is a table of departmental expenses disallowed.

Office Space and Furniture Expense.

The A. T. & T. Company also provided office space and office furniture and fixtures to its said twelve departments and it asks compensation therefor from the operating company as part of the costs of operation of said twelve departments. (Exhibit A-167-B). We consider a part of this expense to be justified, but are disposed to allow but one-half thereof for the same reasons that but one-half of the costs of the Department of Administration and General Service Bureau were allowed as heretofore stated in this opinion and finding. The amounts so allowed are as follows: 1925, $3,157.00; 1926, $731.00; 1927, $837.00; 1928, $912.00; 1929, $974.00; 1930, $1,015.00 and 1931, $1,078.00—Entered on Appendix "G."

Instrument Expenses.

The American Company during the years 1925 to 1927 inclusive incurred cost for maintaining the receivers, transmitters and induction coils (telephones) furnished to the Ohio Bell under the license agreement. This maintenance expense as shown in Exhibit A-162-B was $61,291 for the year 1925; $81,311 for the year 1926 and $86,754 for the year 1927. No question has been raised as to the accuracy of these figures and the Commission finds the same to be

reasonable and allows the sums mentioned as part of the operating expenses for the respective years mentioned.

We conclude and find for the reasons already mentioned that the reasonable amount of cost of the expense of depreciation is represented by an annual depreciation rate of 3% applied to the cost of such instruments, and that such reasonable amounts are found to be as follows: for the year 1925, $51,793; for 1926, $56,506 and for the year 1927, $58,882.

The American Company is also entitled to charge as a cost of furnishing such receivers, transmitters and induction coils (telephones) under the license agreement an annual return of 6% of the reasonable value of such instruments. This 6% computed on the average current cost less accrued depreciation as shown on line 3 Exhibit A-163-B and hereby allowed is as follows: for the year 1925, $95,300; for the year 1926, $103,970, and for the year 1927, $108,343. All allowances under this heading appear on Appendix "G."

Patent Infringement Expenses.

The license agreement also provides that the licensee is entitled to receive from the licensor services in relation to patented and improved devices, and immunity from loss by reason of infringements.

The possibility of infringement damage is too remote to charge the rate payer for a cost or expense which does not exist and not likely to arise when we consider that during all the years from 1925 to the present time there has been no cost to the American Company in the way of loss or damages because of patent infringements of apparatus used by the patrons of the Ohio Bell Company.

We consider that having allowed all of the legal expenses claimed for by the American Company that whatever services may have been rendered in the way of defending infringement cases have been fully compensated in the allowance of legal services already mentioned. For said reasons no amount is allowed as operating expenses under said license contract for alleged patent infringement by

way of losses, damages or otherwise, except as already noted in the way of legal expense.

Taxes and Costs Incurred in Holding Funds Available.

The American Company during the years herein under consideration paid a large amount annually in the way of taxes and also, during the same years, held millions of dollars available so that it might, as claimed by it, respond instantly to demands for sums by any of the associate companies.

The Illinois Statutory Court reached the conclusion that the cost to the American Company of holding funds available to meet current cash requirements of the associate companies, as well as taxes paid by the American Company, are not costs and expenses covered by the contract and should not be included under the allowances for operating expenses. This Commission has come to the same conclusion and disallows any and all claims of said items of cost as a part of the operating expenses of the Ohio Bell Company.

License Contract Costs for 1932 and 1933.

No evidence has been offered of the costs to the American Company for services to the Ohio Bell Company under the License Contract for the years 1932 and 1933 and we are disposed to allow as expense for allowable services for said years the same amount as allowed for the year 1931 or the amount actually paid by the Ohio Bell Company for the years 1932 and 1933 whichever is the lower. The amount therefor to be allowed for 1932 is $521,084. It appears from the record that the Ohio Bell Company paid to the American Company for its services under the contract for the year 1933 the sum of $466,923. Said sum being lower than the amount allowed for the year 1931, we allow the amount as actually paid for that year. The various sums here allowed are set forth in Appendix "G" hereto attached.

Total Expenses and Deductions.

A summary of expenses and deducted allowance are shown on Appendix "F."

Rate of Return.

The Company is entitled to a fair and reasonable return on the value of the property used and useful in the rendition of the service to the public. The Supreme Court of the United States upon numerous occasions has spoken on fair rate of return to a public utility, and while it is not necessary to enter upon an extended review of said decisions, we choose to refer to a few of them which aid us in arriving at a proper determination of what is a fair and reasonable return in this case.

It was said by the court in the case of Smith *v.* Illinois Bell Telephone Company, 282 U. S., 133, 75 L. Ed., 255:

> "A rule as to rate of return cannot be laid down which would apply uniformly to all sorts of utilities; what may be a fair return for one may be inadequate for another, depending upon circumstances, locality and risk."

A 7% rate was found adequate in this case.

And again, in the case of Willcox *v.* Consolidated Gas Company, 212 U. S., 19, 53 L. Ed., 382 the court said:

> "There is no particular rate of compensation which must, in all cases, and in all parts of the country, be regarded as sufficient for capital invested in business enterprises. Such compensation must depend greatly upon circumstances and locality; among other things the amount of risk in the business is a most important factor, as well as the locality where the business is conducted, and the rate expected and usually realized there upon investments of a somewhat similar nature with regard to the risk attending them. • • • The less risk, the less right to any unusual returns upon the investments."

A 6% rate of return was approved in this case.

The court in the case of McCardle *v.* Indianapolis Water Company, 272 U. S., 400, 71 L. Ed., 316, found a 7% rate necessary to be adequate, and in the case of Des Moines Gas Company *v.* Des Moines, 238 U. S., 153, 59 L. Ed., 1244,

and Cedar Rapids Gas Light Company *v.* Cedar Rapids, 223 U. S., 655, 56 L. Ed., 594, it approved a 6% rate of return.

A much cited case is that of Bluefield Water Works and Improvement Company *v.* West Virginia Public Service Commission, 262 U. S., 679, 67 L. Ed., 1176. The court said:

> "What annual rate will constitute just compensation depends upon many circumstances, and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertaking which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties."

In Dayton-Goose Creek R. Co. *v.* United States, 263 U. S., 456, 69 L. Ed., 388, we find the following expression:

> "By investment in a business dedicated to the public service the owner must recognize that, as compared with investment in private business, he cannot expect either high or speculative dividends, but that his obligation limits him to only fair or reasonable profit."

The Supreme Court in United Railways & Electric Company *v.* West, 280 U. S., 234, 74 L. Ed., 390, decided that a rate of return of less than 7.44% was confiscatory and indicated that under some conditions an 8% rate would be no more than necessary. That court at a later date upheld a

7% rate of return for an electric power company. Wabash Valley Electric Co. *v.* Young, 287 U. S., 488, 77 L. Ed. —.

In the recent Chicago case, many times heretofore referred to, the Statutory Court fixed a rate of return ranging from 7½% beginning in 1923 to 5½% for the year 1932.

The Company here under consideration enjoys a virtual monopoly in the territory in which it operates; its business constitutes one of the most substantial and profitable utility businesses in the State; its properties are favorably located in serving many of the large and thriving communities of Ohio; its management is of a high grade of efficiency; its financial position, because of its subsidiary character, is of a very high order, and it has been able by reason thereof to secure funds for its additions and betterments without going into the open market for money and there is no indication that it will be required to enter the public market for finances in the immediate future. It may be said the element of risk to the investor as applied to this company is negligible.

In the Chicago case the court announced that a public utility enjoying the advantages of the Illinois Bell Company is not entitled to the large earnings made by many undertakings during periods of great prosperity, and, on the other hand, its return in times of business adversity should not be reduced to the extent that many private corporations have been impaired.

While a higher rate of return might be proper for the early years under consideration in this proceeding, the present business conditions, generally, do not make unfair or confiscatory a low rate of return to a long established and permanent business such as that of the Ohio Bell Telephone Company.

Considering all matters herein referred to, this Commission is of the opinion and so finds the fair rate of return on the average fair value of the Company's intrastate property to be 7% for each of the years 1925 to 1929 inclusive, 6½% for each of the years 1930 and 1931 and 5½% for each of the years 1932 and 1933.

Applying the net operating income found by this Commission to have been received by the Company for the years

1925 to 1933 inclusive to the rate base found by the Commission, we find the Company received on its intrastate business the following rates of return, namely: 1925, 8.95%; 1926, 9.01%; 1927, 8.79%; 1928, 8.57%; 1929, 8.09%; 1930, 7.52%; 1931, 7.64%; 1932, 6.18%; 1933, 5.51%. This return is in excess of a fair return under conditions existing during the years mentioned.

Applying the rate of return as herein found to be fair and reasonable to the rate base applicable to the intrastate business for the respective years we find that the Company was entitled to earn as its net income the following sums: for the year 1925, $6,559,524; 1926, $7,123,744; 1927, $7,772,557; 1928, $8,569,241; 1929, $9,433,590; 1930, $9,469,398; 1931, $9,442,658; 1932, $7,349,411; 1933, $6,959,232.

We therefore further find that the Company collected and received on its intrastate business an excess net income for said years, as follows: 1925, $1,822,647; 1926, $2,041,483; 1927, $1,986,610; 1928, $1,925,301; 1929, $1,463,347; 1930, $1,481,689; 1931, $1,659,760; 1932, $908,335, a total for said years of $13,289,172. There appears to have been no excess net income for the year 1933. See Appendix "M" for detail figures.

The Commission in the company-wide case fixed June 30, 1925 as the date certain for the valuation of the property. Many Pence Law cases were begun prior to that date, some as much as two years. The Commission has fixed the value of the property and found an excess rate as of that date, and has no complete evidence upon which it may determine the amount of excess payment if any, that may have been made prior to June 30, 1925. This fact may require further investigation as to possible excessive returns in the Pence Law cases between the date of their inception prior to June 30, 1925, and June 30, 1925, the date certain in the company-wide case.

It is, therefore, the finding of this Commission that the rates, charges and schedules of the Company for services rendered, existing on the date certain and subsequently charged and collected, are unjust and unreasonable and that the Company be required to submit new schedules setting forth rates and charges as of the date certain, giving first

consideration to a proper reduction of the increased rates so charged and collected, which shall produce to the Company net income not in excess of that herein found to be fair and reasonable as of June 30, 1925 in order that the Commission may fix and determine the just and reasonable rates and charges as of said date.

It is the further finding of this Commission that of the excess net income collected by the company, as herein found, there be repayment by the Company in manner provided by law, to the customers entitled thereto.

Orders will be entered in harmony with the findings contained in this opinion.

THE PUBLIC UTILITIES COMMISSION OF OHIO,
By FRANK W. GEIGER,
CHARLES F. SCHABER,
Commissioners.

Dated at Columbus, Ohio, this 16th day of January, 1934.

DISSENTING OPINION.

I am obliged to dissent from the majority findings in this case, for the following reasons:

1. The State protested against the tentative fair value (as of June 30, 1925) on the ground that it was too high; the company protested on the ground that it was too low. Both Sloan's and Williams' appraisals (for the company) as of that date were in excess of $140,000,000. State's witness Hagenah's appraisal, omitting certain items, was approximately $113,000,000. The total tentative value as found by the Commission was $104,282,735, which was even less than the actual book cost of the property. It is my judgment the tentative value was unquestionably too low, and should have been increased substantially in the final valuation, witness the fact that in the recent case of Illinois Bell Telephone Company *v.* Gilbert, et al., 3 Fed. Supp. 595 (the so-called Chicago case), the fair value of similar telephone property as of June 30, 1925, was found by the three-judge Federal Court to be more than 20% higher than its book cost.

2. Instead of increasing the total tentative value, which was lower than the book cost of the property as heretofore stated, the majority findings, without any change in the pertinent evidence have cut the further sum of $7,860,459 from the tentative value, thereby reducing the final value to a point far below the actual cost of the property, as of June 30, 1925. In my own mind that cannot be justified; nor is it clear how one of the now concurring Commissioners who in 1931 found the tentative value as of June 30, 1925, to be more than $104,000,000 can now find the value of the same property, as of the same date, to be approximately $96,000,000.

3. For similar reasons the majority findings of fair value for the succeeding years, which start with the low final value as of June 30, 1925, and are for each year much less than even the book cost of the property, are, in my judgment, too low and therefore unfair.

4. By the application of so-called cost trends, the majority findings have still further reduced the value of the property for the years subsequent to June 30, 1925. These cost trends applied in the majority findings do not reflect telephone construction costs. They were derived from trade magazines and other publications not in evidence, and as to which the telephone company has had no opportunity to be heard. Moreover, costs are again on the increase, in fact one of the results of the Government's program is to bring about increases in labor and material prices, and consequently an increase in construction costs. I cannot see that the majority findings have taken that fact into consideration. See McCardle *v.* Indianapolis Water Company, 272 U. S. 400.

5. In reducing the tentative value of the right of way from $1,568,281 to $1,243,034, the majority findings have deviated from the unbroken practice of the Commission in previous cases; have rejected the evidence of the State's witness, Hagenah, and disregarded the decision by the Federal Court of this District in the recent case of Ohio Associated Telephone Co. *v.* Commission, where the court

expressly declined to limit the value of the right of way to the amount shown on the company's books.

6. Based on all of the evidence, as I read it, including that of State's witness, Hagenah, the percent condition of the property as of June 30, 1925, should have been 90% instead of 87%, and for the succeeding years should have been in excess of 90%, due in part to the addition of more than $160,000,000 of new property subsequent to June 30, 1925.

7. The reduction in the percentage allowance for undistributed construction costs or general overheads from 17.25% in the tentative value to 15% in the final value, without any change in the evidence, and the use of 15% for that purpose for the succeeding years is not justified. State's witness, Hagenah, himself testified to 17.25%. In reality the majority findings have not even allowed 15% for general overheads, having omitted any allowance for engineering in the case of many major items of plant. Also, by applying the less-than-15% to a much lower property value than the 17.25% was applied to, the majority findings have still further reduced the amount found for overheads in the tentative value.

8. The reduction of the amount for working capital from $3,500,000 in the tentative value to $2,948,502 in the final value, without any change in the evidence, is equally unjustified. Even the amount of $3,500,000 found by the Commission in the tentative value (and now reduced by $551,498) was less in percentage than the allowance for this item in any other telephone case decided by the Commission of which I have knowledge.

9. In the matter of Construction Work in Progress, for which no amount has been allowed in the majority findings, a utility is compelled to provide the money with which to pay for plant in process of construction. In Ohio it is taxed upon that plant as any other property. There is no sensible reason why it should have been excluded from the rate base. It was included in the rate base in the Chicago case and has been likewise included in many previous cases.

10. Under the evidence in this particular case a separate finding for going concern value was not only proper but necessary. The percentage allowance for that item in the tentative value was lower than in any case of which I have knowledge. Instead of increasing the tentative value allowance, the result of the majority findings is to now reject the item entirely. Certainly I cannot concur in that. In the Chicago case the allowance for going concern value was 8%. In the Columbus Gas and Fuel case (17 Fed. 2nd 630) his honor Judge Hough added 10% for the going concern value, and there are many other cases wherein the amount ranges from 10 to 15%.

11. In general, I am of the opinion that the fair value of the property, both interstate and intrastate, for each year of the period is substantially in excess of its book cost, except toward the end of the period, when it approximates book cost.

12. By reducing the annual expense of depreciation below that actually set aside by the company for that purpose each year, the majority findings disregard all of the pertinent evidence in the case. The correctness of the company's rates of depreciation was not questioned. No witness testified that the Company's rates were too high or claimed that the reserve was excessive for any year. In point of fact, as of June 30, 1925, the amount in the reserve, $12,560,503, was less than enough to provide for the existing depreciation found by the Commission. For that year the percentage of reserve to plant was only 12.75%, and for each of the other years it was even less than that. If, for the period, the company had provided for its depreciation reserve at the 4% rate applied to the property value, by the majority findings, I am satisfied that the balance in the reserve for depreciation as of present time would be less than $5,000,000—an absurd amount, particularly in view of the size of the respondent's property.

13. In my opinion the reduction of the majority findings in the allowable license contract payments below those found to be proper by the Federal Court in the Chicago case is not justified, the evidence in that case and in the

present case on that issue being substantially the same, and the decision of that court being necessarily entitled to great weight.

14. I am unable to conclude that for any one of the years in controversy the rate of return on the fair value of the property under the rates collected has been excessive, unjust or unreasonable. On the contrary, in my opinion, on any reasonable basis of fair value of the property for the years, and after making proper adjustments in the revenues and expenses, the rates collected have provided only a reasonable return on the fair value of the property used and useful in the service and convenience of the public for the years in question.

In a recent case decided by the Supreme Court of the United States, January 6, 1930, United Railways *v.* West, 280 U. S. 234, the Court said:

> "• • • It is manifest that just compensation for a utility, requiring for efficient public service skillful and prudent management as well as use of the plant, and whose rates are subject to public regulation, is more than current interest on mere investment. Sound business management requires that after paying all expenses of operation, setting aside the necessary sums for depreciation, payment of interest and reasonable dividends, there should still remain something to be passed to the surplus account; and a rate of return which does not admit of that being done is not sufficient to assure confidence in the financial soundness of the utility to maintain its credit and enable it to raise money necessary for the proper discharge of its public duties. In this view of the matter, a return of 6.26 per cent is clearly inadequate. In the light of recent decisions of this court and other Federal decisions, it is not certain that rates securing a return of 7½ per cent or even 8 per cent on the value of the property would not be necessary to avoid confiscation. • • •"

In citing from the foregoing case, I do not necessarily advocate an 8% return as the fair rate of return for the

utility at the present time. The point here and the one I wish to emphasize is that for no part of the period in controversy in the present case have the majority findings allowed a return of even as much as 7½% on the property.

See also Section 614-46 of the General Code of Ohio which, in substance, provides:

> "If the Commission • • • shall be of the opinion that the rate • • •, so fixed by ordinance is or will be unjust or unreasonable, or insufficient to yield reasonable compensation for the service, the commission shall, with due regard to the value of all the property of the public utility, actually used and useful for the convenience of the public, excluding therefrom the value of any franchise or right to own • • • and exclusive of any value thereto by reason of a monopoly or merger *and to the necessity of making reservations from the income for surplus, depreciation and contingencies, and such other matters as may be proper, according to the fact in each case,* fix and determine the just and reasonable rate • • • collected by such public utility.

See Indiana Bell Telephone Co. *v.* Commission, 300 Fed. 190; Pac. Telephone & Telegraph Co. *v.* Whitcomb, 12 Fed. 2nd, 279; Northwestern Bell Telephone Co. *v.* Commission, 6 Fed. 2nd, 663.

15. In my opinion, the majority findings, in determining that a portion of the moneys represented by the rates collected by the Company under bond should be repaid, without having first accorded the Company an opportunity to offer separate evidence of property value, revenues and expenses and return for the exchanges with respect to which refunders are to be made, is illegal and contrary to the opinion of the attorney for the Commission recently rendered at the Commission's request. The telephone company has frequently insisted upon its right to offer such evidence and that right has been preserved to it in the record. This right has not been waived.

16. The confiscatory character of the majority findings is perhaps best shown by the fact that notwithstanding the

tentative value of the property as of June 30, 1925, was $104,282,735, and notwithstanding since that date the company has admittedly expended more than $160,000,000 for new property, the total present value of all of the property as of November 30, 1933, is now fixed in the majority findings at only $126,000,000. This would mean that as of November 30, 1933, the Company had retired all of the $104,282,735, plus $34,000,000 of the $160,000,000,—which is contrary to all of the evidence in the case.

To the foregoing grounds of dissent many others might be added, such, for example, as the disallowances of any amount for engineering on certain items of plant, the exclusion of other items of plant from the amount upon which the allowance for omissions is computed, etc., all contrary to the established practice of this Commission in previous telephone rate cases. Under the circumstances, however, it is unnecessary to comment on these items in detail, the other grounds hereinabove set forth being more than sufficient, in my judgment, to show that the majority findings do not comply with the decisions of the United States Supreme Court and other Federal Courts. See Bluefield, etc., *v.* P. U. C. of W. Va. 262 U. S. 679, and Southwestern Bell Telephone Company *v.* Ft. Smith, 294 Fed. 102 (Affd. 270 U. S. 627).

Conclusion.

I cannot, therefore, concur with my colleagues and their findings in this important case. To do so would require me to disregard the law and to find contrary to the evidence in the case and this I am unwilling to, and cannot, do.

Dated at Columbus, Ohio, this 16th day of January, 1934.

E. J. HOPPLE,
Chairman.

Counsel:

KARL E. BURR,
WILLIAM A. THOMPSON,
Attorneys for The Ohio Bell Telephone Company.

THOMAS J. HERBERT,
Special Counsel for State.

Former Special Counsel for State:
W. S. McConnaughey,
Fred W. Postle,
Albert M. Calland.

Attorney General:
John W. Bricker.

Former Attornies General:
C. C. Crabbe,
Edw. C. Turner,
Gilbert H. Bettman.

Akron, G. H. Doolittle, R. A. Hershey, C. B. MacDonald, A. B. Underwood; Barberton, A. B. Castleberry; Bellaire, John Lavelle, Esther F. Pinsky; Canton, Russell H. Mack; Cleveland, H. S. Brainard, Harold H. Burton, W. George Kerr; Columbus, J. L. Davies; Coshocton, Carl M. Patterson; Dayton, J. B. Harshman, H. S. Beane; East Liverpool, G. J. Clarks; Fremont, R. A. Huntsinger; Gerard, Edward Rees; Ironton, F. A. Ross; Kent, S. P. Harbourt; Lancaster, Esther H. Brocker, E. A. Silbaugh; London, James F. Bell; Marietta, T. B. Summers; Martins Ferry, Thomas J. Joseph; Massillon, E. D. Graybill, W. W. Wendling; Middletown, Henderson Estes; Mingo Junction, L. M. Sedgwick; Niles, P. Z. Hodge, S. P. Mango; Osborn, Morris B. Rice; Piqua, B. S. Keyt; Salem, Cecil Scott; Sandusky, C. E. Moyer; Springfield, M. E. Spencer; Strongsville, Edward Blyphin; Steubenville, Amanda Z. Stayer, Carl A. Weinman; Toledo, S. Z. Cafflin, J. I. Connor, M. S. Dodd, D. J. O'Rourke; Urbana, Edwin L. English; Upper Sandusky, F. J. Stalter; Washington C. H., A. N. Browning; Xenia, W. A. Miller; Youngstown, Carl Armstrong, H. H. Wickham; Zanesville, P. F. Thompson.

City Solicitors and Directors of Law.

APPENDIX A

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

SUMMARY OF FINAL VALUATION AS OF JUNE 30, 1925

Line No.	Acct. No.	Description	Reproduction Value	Percent Condition	Present Value
1.	207	Right of way	$1,243,084	100.00	$1,243,084
2.	211	Land	3,256,854	100.00	3,256,854
3.	213	Buildings	7,788,774	90.18	7,023,924
4.		Total Land and Buildings	$11,045,628	Ave. 93.08	$10,280,778
5.	221	Central Office Telephone Equipment	17,199,740	85.75	14,748,777
6.	222	Other Equipment of Central Offices	634,689	84.72	537,709
7.		Total Central Office Equipment	$17,834,429	Ave. 85.71	$15,286,486
8.	231	Station Apparatus	5,759,956	85.68	4,935,066
9.	232	Station Installations	2,034,423	80.00	1,627,538
10.	233	Interior Block Wires	83,881	80.00	67,105
11.	234	Private Branch Exchanges	3,384,995	85.75	2,902,633
12.	235	Booths and Special Fittings	167,201	80.00	133,761
13.		Total Station Equipment	$11,430,456	Ave. 84.56	$9,666,123
14.	241	Exchange Pole Lines	9,412,432	72.98	6,864,844
15.	242	Exchange Aerial Cable	8,055,194	87.71	7,064,968
16.	243	Exchange Aerial Wire	4,556,220	76.72	3,495,368
17.	244	Exchange Underground Conduit	9,386,032	95.00	8,916,730
18.	245	Exchange Underground Cable	9,810,730	91.85	9,011,062
19.	246	Exchange Submarine Cable	19,730	95.00	18,744
20.		Total Exchange Lines	$41,240,338	Ave. 85.77	$35,371,706
21.	251	Toll Pole Lines	6,108,489	80.93	4,943,325
22.	252	Toll Aerial Cable	536,254	91.50	490,692
23.	253	Toll Aerial Wire	3,842,664	91.78	3,526,696
24.	254	Toll Underground Conduit	30,493	95.00	28,968
25.	255	Toll Underground Cable	421,257	91.64	386,062
26.	256	Toll Submarine Cable	12,652	95.00	12,019
27.		Total Toll Lines	$10,951,809	Ave. 85.72	$9,387,732
28.	261	Office Furniture and Fixtures	624,244	85.00	530,607
29.	263	General Store Equipment	18,181	85.00	15,454
30.	264	General Stable and Garage Equipment	652,381	75.00	489,248
31.	265	General Tools and Implements	422,051	70.00	295,436
32.		Total General Equipment	$1,716,807	Ave. 77.51	$1,330,745
33.		Total Physical Property	$95,462,501	Ave. 86.49	$82,566,604
		Undistributed Construction Expenditures:			
34.		Omissions 1%	814,370	Ave. 85.58	697,120
35.		Interest During Construction..... 6%	5,727,750	" 86.49	4,953,996
36.		Engineering 5%	3,243,948	" 85.67	2,779,056
37.		Taxes During Construction..... 1%	964,625	" 86.49	825,666
38.		General Expenses 2%	1,909,250	" 86.49	1,651,382
39.		Total Undistributed Construction Expenditures...	$12,650,143	Ave. 86.22	$10,907,170
40.		Total Fixed Capital	$108,112,644	Ave. 86.46	$93,473,774
41.		Working Capital Including Materials & Supplies....	2,948,502	100.00	2,948,502
42.		Total Property Used and Useful	$111,061,146	Ave. 86.62	$96,422,276
		Less,—			
43.		Interstate Proportion of Total.....2.81559%	3,126,949	" 86.62	2,714,788
44.		Intrastate Property Used and Useful...97.18441%	$107,934,197	Ave. 86.62	$93,707,488

APPENDIX B

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

VALUATION OF PROPERTY USED AND USEFUL FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE AND TRENDS OF SUCH VALUATION.

	June 30, 1925	Last 6 Mos. 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931	Year 1932	11 Mos. 1933
Fixed Capital										
All Items Except Right of Way and Restored Land Values—										
1. Final Valuation Fixed by Commission	$92,118,867									
2. Trended Value First of Period—Percent of Line 6	.....	100.00% A	98.73% B	98.97% C	99.20% D	101.45% E	96.65% F	98.95% G	88.71% H	102.96% I
3. Trended Value First of Period—Amount	.....	$92,118,867	$96,811,586	$100,642,148	$116,752,169	$129,566,976	$137,815,645	$142,205,570	$129,465,177	$130,562,050
4. Net Additions During Period—Per Books at 100%	.....	5,431,559	7,475,855	17,051,571	10,962,937	14,516,292	13,547,888	8,736,462	2,686,872*	1,254,329*
5. Trended Value End of Period	92,118,867 A	97,550,426 B	103,786,891 C	117,693,719 D	127,715,106 E	144,083,267 F	151,363,033 G	145,942,032 H	126,798,305 I	129,307,721
Right of Way:										
6. Book Value plus Undistr. Constr. Exp. End of Period—at 100%	1,354,907	1,421,549	1,418,728	1,420,376	1,500,857	1,579,461	1,712,919	1,743,117	1,752,806	1,754,696
Restored Land Values:										
7. Trended Value End of Period—Per Appendix "C"	.....	2,430	86,570	484,401	521,174	665,999	644,051	806,085	586,771	556,172
8. Total Fixed Capital End of Period	$93,473,774	$98,974,405	$105,242,189	$119,598,496	$129,737,137	$146,328,727	$153,720,003	$148,290,234	$129,118,882	$131,608,588
	6-30-25		6-30-26	6-30-27	6-30-28	6-30-29	6-30-30	6-30-31	6-30-32	6-30-33
Average Fixed Capital:										
9. Based Upon Line 8, First and End of Period	96,473,774		102,106,297	112,420,342	124,667,816	138,032,932	150,024,365	151,005,118	138,704,308	130,363,485
Working Capital Including Materials and Supplies										
10. Average Per Appendix "E"	2,948,502		2,923,563	3,052,701	3,218,291	3,451,024	3,250,138	2,804,990	2,427,696	3,044,894
Total Property Used and Useful										
11. Total Lines 9 and 10	96,422,276		105,081,860	115,473,043	127,886,107	141,483,956	153,274,503	153,810,108	141,202,004	133,408,379
Less—										
12. Interstate Proportion of Total	2,714,788		3,264,086	4,436,521	5,468,873	6,718,880	7,591,456	8,538,445	7,576,849	7,158,173
13. Intrastate Property Used and Useful	$93,707,488		$101,767,774	$111,036,522	$122,417,735	$134,765,576	$145,683,047	$145,271,663	$133,625,655	$126,250,206

NOTE—The composite percentages shown on Line 2 were developed by the Commission's Engineers and represent the relation of values for each current period to the preceeding period and they have been applied to the basic figures bearing corresponding alphabetical designations.

The total property used and useful shown on Lines 11 to 13 inclusive is forwarded to the rate study on Appendix "M". Interstate and Intrastate Allocations have been made on the basis of percentages shown on Appendix "L".

Line 6 includes undistributed construction expenditures at 6-30-25 added to book figures in all columns as follows: 6% interest during construction, $74,582—Taxes during construction, $12,430—General expenses, $24,861—Total, $111,873. There is also included a book deduction covering re-classification during the 11 months of 1933 in the amount of $3,580.

*Indicates red figures.

APPENDIX C

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

RESTORATION OF LAND VALUES FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE AND TRENDS OF SUCH VALUES.

	June 30, 1925	Last 6 Mos. 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931	Year 1932	11 Mos. 1933
Restoration Due to Becoming Useful										
Land Values Disallowed as Not Used and Useful:										
1. At 6-30-25—Trended Value—Percent of Line 2		100.00% A	98.73% B	98.97% C	99.20% D	101.45% E	95.65% F	98.96% G	98.71% H	102.96% I
2. Trended Value—Amount	$686,613 A	$686,613 B	$677,893 C	$667,858 D	$653,084 E	$661,649 F	$632,772 G	$594,489 H	$527,871 I	$543,961
Periods During Which Disallowed Land Values Continued to Be Not Used and Useful:										
3. Parcel No. 17—Columbus, to July, 1925	2,430	.....	.....	.....	.....	.....	.....	.....	.....	.....
4. " " 21—Cleveland, to June, 1926	84,609 A	84,609	.....	.....	.....	.....	.....	.....	.....	.....
5. " " 8—Toledo, to April, 1927	159,280 A	159,280 B	157,237	.....	.....	.....	.....	.....	.....	.....
6. " " 19—Cleveland, to May, 1927	309,664 A	309,664 B	305,731	.....	.....	.....	.....	.....	.....	.....
7. " " 18—Columbus, to February, 1928	20,200 A	20,200 B	20,042 C	19,436	.....	.....	.....	.....	.....	.....
8. " " 1—Springfield, to October, 1928	22,500 A	22,500 B	22,214 C	21,541	.....	.....	.....	.....	.....	.....
9. " " 17—Cleveland, to December, 1929	55,200 A	54,200 B	54,499 C	52,848 D	52,425	.....	.....	.....	.....	.....
10. " " 3—Dayton, to Date	72,500 A	72,500 B	71,579 C	69,410 D	68,856 E	69,858 F	68,814 G	63,772 H	55,535 I	57,333
11. " " 9—Toledo, to Date	7,000 A	7,000 B	6,911 C	6,702 D	6,648 E	6,744 F	6,451 G	6,081 H	5,377 I	5,536
12. " " 1—Coshocton, to Date	3,150 A	3,150 B	3,110 C	3,016 D	2,993 E	3,035 F	2,903 G	2,727 H	2,419 I	2,491
13. Total Trended Values During Periods of Non-Use	$686,613	$684,183	$641,323	$172,952	$180,990	$79,632	$76,168	$71,580	$63,451	$65,360
14. Total Restoration Due to Becoming Useful (3-13)	.....	2,430	36,570	484,401	621,174	581,917	556,804	522,929	463,890	477,951
Restoration Due to Reduction of Book Net Additions										
15. Parcel No. 3—Dayton, Cr. Net Add'ns in June, 1929	.....	.....	.....	.....	.....	84,982 F	89,434 G	76,558 H	67,028 I	69,013
16. Parcel No. 9—Toledo, Cr. Net Add'ns in Sept., 1930	.....	.....	.....	.....	.....	.....	7,888 G	6,586 H	5,653 I	6,029
17. Parcel No. 1—Coshocton, Cr. Net Add'ns in Jan., 1933	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,513
18. Total Restoration Due to Reduction of Net Add'ns	.....	.....	.....	.....	.....	$84,982	$97,447	$82,156	$72,681	$78,551
19. Total Restored Land Values (Line 14 plus Line 18)	.....	$2,430	$36,570	$484,401	$621,174	$666,899	$644,051	$605,085	$536,771	$556,172

NOTE—The composite percentages shown on Line 1 were developed by the Commission's Engineers and represent the relation of values for each current period to the preceeding period and they have been applied to the basic figures bearing corresponding alphabetical designations.
The totals on Line 19 are forwarded to Appendix "B", Line 7.

APPENDIX D

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

UNDISTRIBUTED CONSTRUCTION EXPENDITURES AS OF JUNE 30, 1925

Basic Figures as of 6-30-25		Reproduction Value	Present Value
1. Total physical property per Appendix "A" Line 33		$95,462,501	$82,566,604
Less:			
2. Right of way	Acct. 207	1,243,034	1,243,034
3. Land	Acct. 211	3,256,854	3,256,854
4. Buildings	Acct. 212	7,788,774	7,023,924
5. General Equipment	Acct. 261-265	1,716,807	1,330,745
6. Total		$14,005,469	$12,854,557
7. Balance physical property		$81,457,032	$69,712,047
Less:			
Estimated material values of W. E. Co. installed switchboards:			
8. Central Office telephone equipment	Acct. 221	$11,422,613	$9,794,891
9. Other equipment of Central Offices	Acct. 222	118,524	100,414
10. Private branch exchanges	Acct. 234	875,665	750,889
Estimated material value of wire:			
11. Interior block wires	Acct. 233	40,928	32,742
12. Exchange aerial wire	Acct. 243	2,188,925	1,679,343
13. Toll aerial wire	Acct. 253	1,931,413	1,772,651
14. Total		$16,578,068	$14,130,924
15. Balance physical property		$64,878,964	$55,581,123
Undistributed Construction Expenditures as of 6-30-25			
16. Omissions ..... 1% of Line 7		$814,570	$697,120
17. Interest during construction ..... 6% of Line 1		5,727,750	4,963,996
18. Engineering ..... 5% of Line 15		3,243,948	2,779,056
19. Taxes during construction ..... 1% of Line 1		964,625	825,666
20. General expenses ..... 2% of Line 1		1,909,250	1,651,332
21. Total		$12,650,143	$10,907,170

APPENDIX E

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3387

WORKING CAPITAL INCLUDING MATERIALS AND SUPPLIES FOR EACH YEAR FROM 1925 TO 1933 BOTH INCLUSIVE

	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931	Year 1932	11 Mos. 1933
Working Capital—									
Average Expenses for One Month:									
1. Current Maintenance Expenses	$395,363	$437,474	$464,435	$509,929	$634,729	$636,599	$609,012	$540,520	$467,681
2. Traffic Expenses	626,387	672,885	709,133	707,987	775,718	709,413	596,288	459,793	332,807
3. Commercial Expenses	191,611	207,937	229,397	251,889	286,423	293,008	302,988	287,621	207,195
4. General & Miscellaneous Expenses	81,344	81,306	98,240	152,924	174,759	162,498	160,584	142,328	163,354
5. Taxes Assignable to Operations	215,914	248,758	279,002	309,250	310,378	345,605	339,484	340,681	353,100
6. Rent Deductions	47,547	49,417	48,538	45,585	61,133	73,209	59,631	46,474	37,958
7. Total Expenses for One Month	$1,558,166	$1,697,777	$1,828,745	$1,977,564	$2,243,140	$2,220,332	$2,067,987	$1,817,397	$1,562,095
Materials and Supplies—									
Average Book Inventory:									
8. Balance First of Period	See	1,403,783	1,047,788	1,400,125	1,081,329	1,334,439	725,172	748,834	611,764
9. Balance End of Period	Note	1,047,788	1,400,125	1,081,329	1,334,439	725,172	748,834	611,764	2,353,834
10. Average for Each Period	1,390,336	1,225,786	1,223,956	1,240,727	1,207,884	1,029,806	737,003	680,299	1,482,799
11. Total Working Capital Including Materials and Supplies, (Line 7 plus Line 10)	$2,948,502	$2,923,563	$3,052,701	$3,218,291	$3,451,024	$3,250,138	$2,804,990	$2,497,696	$3,044,894

NOTE—Actual materials and supplies at June 30, 1925, per books used for 1925; average based upon balances at first and end of each period used for other years. The totals on Line 11 are forwarded to Appendix "B", Line 10.

APPENDIX F

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

REVENUES, EXPENSES AND NET INCOME FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE.

	Year 1925			Year 1926		
	Total	Interstate	Intrastate	Total	Interstate	Intrastate
Revenues						
1. Exchange Service Revenues	$28,554,399	$273,896	$24,280,503	$26,629,407	$304,793	$26,323,614
2. Toll Service Revenues	5,966,066	670,341	5,296,715	6,832,179	777,908	6,054,271
3. Miscellaneous Operating Revenues	720,598	31,660	688,938	744,883	40,471	704,412
4. Total	$31,241,063	$975,897	$30,265,156	$34,206,469	$1,123,172	$33,082,297
5. Less, Licensee Revenue—Dr.	520,077	14,862	505,215	574,557	17,467	557,090
6. Telephone Operating Revenues	$30,720,976	$961,035	$29,759,941	$33,630,912	$1,105,705	$32,525,207
7. Net Non-Operating Revenues	120,234	19,970	100,264	132,783	36,631	96,152
8. Total Revenues	$30,841,210	$981,005	$29,860,205	$33,763,695	$1,142,336	$32,621,359
Expenses and Deductions						
9. Current Maintenance Expenses	$4,744,887	$116,558	$4,627,799	$5,249,688	$145,818	$5,104,870
10. Depreciation of Tel. Plant and Equipment	3,378,236	98,819	3,279,417	3,726,384	110,762	3,615,622
11. Traffic Expenses	7,516,642	269,016	7,247,626	8,074,616	314,858	7,759,758
12. Commercial Expenses	2,299,331	72,018	2,227,313	2,486,252	81,956	2,413,294
13. General and Miscellaneous Expenses	976,134	28,893	947,241	975,872	31,906	943,787
14. Uncollectible Operating Revenues	68,155	2,692	65,462	163,410	5,376	158,034
15. Taxes Assignable to Operations	2,590,970	70,691	2,520,279	2,965,097	85,414	2,899,683
16. Rent Deductions	570,563	27,667	542,896	592,005	31,291	561,614
17. Western Electric Co. Excess Profits—Cr.						
18. Total Expenses and Deductions	$22,159,898	$681,354	$21,478,084	$24,283,124	$806,992	$23,456,132
Net Income						
19. Line 8 less Line 18	$8,681,822	$299,651	$8,382,171	$9,560,571	$335,344	$9,185,227

	Year 1930			Year 1931		
	Total	Interstate	Intrastate	Total	Interstate	Intrastate
Revenues						
20. Exchange Service Revenues	$34,422,892	$446,089	$33,976,803	$33,722,537	$457,974	$33,265,563
21. Toll Service Revenues	8,949,066	1,172,602	7,776,464	8,185,853	1,140,278	7,053,805
22. Miscellaneous Operating Revenues	1,531,087	402,561	1,128,476	1,532,459	486,288	1,046,171
23. Total	$44,902,995	$2,021,252	$42,881,743	$43,437,879	$2,083,540	$41,354,339
24. Less, Licensee Revenue—Dr.	532,488	18,619	514,869	521,964	19,853	501,231
25. Telephone Operating Revenues	$44,369,507	$2,002,633	$42,366,874	$42,916,795	$2,063,787	$40,853,008
26. Net Non-Operating Revenues	38,432		38,432	31,982		31,982
27. Total Revenues	$44,407,939	$2,002,633	$42,405,306	$42,948,777	$2,063,787	$40,884,990
Expenses and Deductions						
28. Current Maintenance Expenses	$7,689,184	$239,585	$7,399,599	$7,306,142	$228,781	$7,079,361
29. Depreciation of Tel. Plant and Equipment	5,735,502	246,941	5,488,561	6,099,342	294,144	5,805,198
30. Traffic Expenses	8,512,964	437,210	8,065,744	7,155,461	387,334	6,768,127
31. Commercial Expenses	3,516,099	160,181	3,355,918	3,653,855	184,545	3,471,310
32. General and Miscellaneous Expenses	1,949,976	89,909	1,860,067	1,927,010	95,104	1,831,910
33. Uncollectible Operating Revenues	589,533	24,400	515,133	475,443	22,869	452,574
34. Taxes Assignable to Operations	4,147,264	181,122	3,966,122	4,073,807	208,029	3,865,778
35. Rent Deductions	678,504	74,004	604,500	715,589	59,161	656,428
36. Western Electric Co. Excess Profits—Cr.	23,908*	678*	23,230*	154,254*	6,254*	148,000*
37. Total Expenses and Deductions	$33,896,108	$1,441,889	$31,454,219	$31,236,845	$1,453,773	29,783,072
Net Income						
38. Line 27, less Line 37	$11,511,831	$560,744	$10,951,087	$11,712,432	$610,014	$11,101,418

APPENDIX F

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

REVENUES, EXPENSES AND NET INCOME FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE—Concluded.

	Year 1927			Year 1928			Year 1929		
	Total	Interstate	Intrastate	Total	Interstate	Intrastate	Total	Interstate	Intrastate
Revenues									
1. Exchange Service Revenues	$28,617,757	$343,804	$28,269,963	$30,447,907	$372,260	$30,075,647	$33,431,682	$444,903	$32,986,779
2. Toll Service Revenues	7,307,442	891,713	6,415,729	8,316,646	1,017,569	7,299,077	9,446,102	1,264,290	8,281,812
3. Miscellaneous Operating Revenues	872,319	36,338	835,981	926,831	43,308	883,518	1,506,401	462,325	1,043,076
4. Total	$36,797,518	$1,276,445	$35,521,073	$39,691,374	$1,433,132	$38,258,242	$44,383,185	$2,151,518	$42,231,667
5. Less, Licensee Revenue—Dr.	636,405	20,556	615,849	420,895	14,189	406,709	443,601	16,546	427,055
6. Telephone Operating Revenues	$36,161,113	$1,255,889	$34,905,224	$39,270,479	$1,418,943	$37,851,533	$43,939,584	$2,134,972	$41,804,612
7. Net Non-Operating Revenues	290,329	194,167	96,162	370,838	213,726	157,112	45,127	.....	45,127
8. Total Revenues	$36,451,442	$1,450,056	$35,001,386	$39,641,314	$1,632,669	$38,008,645	$43,984,711	$2,134,973	$41,849,739
Expenses and Deductions									
9. Current Maintenance Expenses	$5,573,216	$175,217	$5,397,999	$6,119,143	$201,538	$5,917,605	$7,618,749	$265,510	$7,351,239
10. Depreciation of Tel. Plant and Equipment	4,208,774	145,845	4,062,929	4,728,613	179,011	4,549,602	5,186,438	222,616	4,963,810
11. Traffic Expenses	8,509,593	365,951	8,143,982	8,496,841	379,891	8,116,950	9,308,618	464,298	8,844,320
12. Commercial Expenses	2,755,760	101,067	2,651,693	3,022,674	121,968	2,900,738	3,437,074	165,288	3,271,686
13. General and Miscellaneous Expenses	1,178,986	45,151	1,133,735	1,835,084	76,818	1,758,766	2,097,101	96,048	2,001,053
14. Uncollectible Operating Revenues	158,708	5,523	153,185	212,916	7,677	205,239	312,751	15,168	297,583
15. Taxes Assignable to Operations	3,848,025	118,133	3,729,892	3,710,996	145,702	3,565,294	3,734,540	168,127	3,566,413
16. Rent Deductions	512,460	38,606	473,854	547,026	46,116	500,909	733,596	66,896	666,699
17. Western Electric Co. Excess Profits—Cr.	.....	.....	.....	.....	.....	.....	.....	.....	.....
18. Total Expenses and Deductions	$26,237,422	$996,303	$25,242,719	$28,672,292	$1,158,189	$27,514,103	$32,416,855	$1,464,053	$30,952,802
Net Income									
19. Line 8 less Line 18	$10,214,020	$454,653	$9,759,167	$10,969,022	$474,480	$10,494,542	$11,567,856	$670,919	$10,896,937

	Year 1930			Year 1933		
	Total	Interstate	Intrastate	Total	Interstate	Intrastate
Revenues						
20. Exchange Service Revenues	$30,088,221	$345,290	$29,698,081	$25,929,298	$298,057	$25,631,241
21. Toll Service Revenues	6,849,190	787,309	5,561,881	5,530,326	680,483	4,949,893
22. Miscellaneous Operating Revenues	1,403,906	445,839	958,067	1,375,411	436,790	938,621
23. Total	$37,791,417	$1,558,438	$36,282,979	$32,985,035	$1,415,280	$31,519,755
24. Less, Licensee Revenue—Dr.	521,084	14,590	506,494	466,923	13,074	453,849
25. Telephone Operating Revenues	$37,270,333	$1,543,848	$35,726,485	$32,468,112	$1,402,206	$31,065,906
26. Net Non-Operating Revenues	18,843	.....	18,843	.....	.....	.....
27. Total Revenues	$37,289,176	$1,543,848	$35,745,328	$32,468,112	1,402,206	31,065,906
Expenses and Deductions						
28. Current Maintenance Expenses	$6,486,243	178,563	6,307,680	$5,612,177	$154,501	$5,457,676
29. Depreciation of Tel. Plant and Equipment	6,134,880	276,879	5,858,001	6,078,457	274,333	5,804,124
30. Traffic Expenses	5,517,517	268,041	5,249,476	3,988,681	194,013	3,799,668
31. Commercial Expenses	3,451,455	111,876	3,339,579	2,486,337	80,592	2,405,745
32. General and Miscellaneous Expenses	1,707,984	76,857	1,631,077	1,960,247	88,211	1,872,036
33. Uncollectible Operating Revenues	810,357	33,549	776,818	296,731	12,284	284,437
34. Taxes Assignable to Operations	4,087,983	181,414	3,906,519	4,237,201	188,088	4,049,163
35. Rent Deductions	567,683	36,529	531,154	455,498	21,666	433,825
36. Western Electric Co Excess Profits—Cr.	117,028*	4,306*	112,722*	.....	.....	.....
37. Total Expenses and Deductions	$28,636,984	$1,149,402	$27,487,582	$25,120,314	$1,013,640	$24,106,674
Net Income						
38. Line 27, less Line 37	$8,652,192	$394,446	$8,257,746	$7,347,798	$388,566	$6,959,232

NOTE—Licensee Revenue—Dr. shown on lines 5 and 24 is analyzed on Appendix "G".

Depreciation of telephone plant and equipment shown on lines 10 and 29 is analyzed on Appendix "K".

Interstate and Intrastate allocations have been made on the basis of percentages shown on Appendix "L".

Amounts for the year 1933 are estimated on the basis of eleven months' operations to 11-30-33.

The net income shown on lines 19 and 38 is forwarded to the rate study on Appendix "M".

* Indicates red figures.

APPENDIX G

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

COST OF A. T. & T. COMPANY LICENSE CONTRACT SERVICES ALLOWED AS A DEDUCTION FROM REVENUES UNDER ACCT. 527—LICENSEE REVENUE—DR.—FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE

Costs Allowed	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929
1. A. T. & T. Co. departmental expenses—Appenix "H"	$308,536	$332,039	$381,589	$419,986	$442,627
2. Office space and furniture expense	3,157	731	837	912	974
3. Instrument maintenance	61,291	81,311	86,754	.....	.....
4. Instrument depreciation	51,793	56,506	58,882	.....	.....
5. Return on instruments	95,300	103,970	108,343	.....	.....
6. Total costs allowed	$520,077	$574,557	$636,405	$420,898	$443,601
Payments Made					
7. Licensee Revenue—Dr.—(Acct. 527) per books	1,274,052	1,277,944	1,402,144	752,524	626,184
Expense Allowed					
8. Line 6 or 7, whichever is lower	520,077	574,557	636,405	420,898	443,601

Costs Allowed	Year 1930	Year 1931	Year 1932	Year 1933
9. A. T. & T. Co. departmental expenses—Appendix "H"	$532,473	$520,006	See Note	
10. Office space and furniture expense	1,015	1,078		
11. Instrument maintenance	.....	.....		
12. Instrument depreciation	.....	.....		
13. Return on instruments	.....	.....		
14. Total costs allowed	$533,488	$521,084	$521,084	$521,084
Payments Made				
15. Licensee Revenue—Dr.—(Acct. 527) per books	638,043	619,171	545,067	466,923
Expense Allowed				
16. Line 14 or 15, whichever is lower	533,488	521,084	521,084	466,923

NOTE: As there is no evidence in the record concerning costs for 1932 and 1933, they have been estimated at the same amount as for 1931.

Payments made of Licensee Revenue—Dr.—for 1933 have been estimated on the basis of payments for the eleven months ended November 30, 1933.

The amounts on lines 8 and 16 are forwarded to Exhibit "F", lines 5 and 24.

APPENDIX H

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

A. T. & T. Company Departmental Expenses Allowed and Disallowed as Part of Cost of License Contract Services for Each Year from 1925 to 1931, Both Inclusive.

	Dept. No.	Proportion	Reference to Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Departmental Expenses Allowed										
1. Operation and Engineering	No. 1	Entire	A-108-B	$121,300	$131,722	$141,563	$154,161	$168,039	$176,470	$164,528
2. Development and Research	No. 2	Partial	A-117-B	100,387	108,968	131,464	147,267	160,696	230,916	235,932
3. Information	No. 3	None	A-124-B							
4. Personnel	No. 4	Partial	A-150 & 151-B	14,824	17,526	28,572	30,782	34,845	35,291	33,886
5. Public Relations	No. 5	None	A-153-B							
6. Treasurer	No. 6	Partial	A-154-B	606	680	1,214	958	1,119	1,281	1,260
7. Comptroller	No. 7	Partial	A-155-B	22,752	24,620	26,088	27,202	29,315	30,626	30,505
8. Secretary	No. 8	None	A-156-B							
9. Administrative Including Sundry	No. 9	One-half	A-157-B	14,361	14,106	16,336	14,586	15,558	14,384	12,923
10. General Service Bureau	No. 10	One-half	A-158-B	7,023	8,063	8,277	8,890	9,833	10,443	9,535
11. Operation—General	No. 11	None	A-159-B							
12. Legal	No. 12	Entire	A-160-B	27,283	26,354	28,075	36,140	23,222	33,062	31,437
13. Total Allowed			A-170-B, Line A	$308,536	$332,039	$381,589	$419,986	$442,627	$532,473	$520,006
Departmental Expenses Disallowed										
14. Operation and Engineering	No. 1	None	A-108-B							
15. Development and Research	No. 2	Partial	A-117-B	39,613	56,032	75,536	69,733	109,304	149,984	102,068
16. Information	No. 3	Entire	A-124-B	31,184	35,103	31,514	41,441	55,377	54,324	52,365
17. Personnel	No. 4	Partial	A-150 & 151-B	9,120	9,853	7,776	6,196	6,778	6,845	5,674
18. Public Relations	No. 5	Entire	A-153-B	1,129	1,086	1,086	1,120	1,444	1,932	1,483
19. Treasurer	No. 6	Partial	A-154-B	35,525	50,871	39,768	61,266	59,818	91,774	58,949
20. Comptroller	No. 7	Partial	A-155-B	22,721	24,647	26,936	29,436	31,332	33,508	31,810
21. Secretary	No. 8	Entire	A-156-B	2,389	2,453	2,348	2,571	2,639	2,527	2,038
22. Administrative Including Sundry	No. 9	One-half	A-157-B	14,361	14,106	16,335	14,585	15,559	14,385	12,922
23. General Service Bureau	No. 10	One-half	A-158-B	7,023	8,063	8,278	8,890	9,832	10,443	9,535
24. Operation—General	No. 11	Entire	A-159-B	8,694	9,682	9,349	10,113	10,857	11,147	10,071
25. Legal	No. 12	None	A-160-B							
26. Total Disallowed			A-170-B, Line A	$171,759	$211,896	$218,926	$245,351	$302,940	$375,969	$286,915
Total Departmental Expenses										
27. As Shown on Appendix "J", Line 26				$480,295	$543,935	$600,515	$665,337	$745,567	$908,442	$806,921
Note—The amounts on line 13 are forwarded to Appendix "G", lines 1 & 9. The partial amounts allowed on line 7 cover the following items:										
Comptroller—Dept. No. 7—										
Bell System Methods			A-155-B	$9,473	$10,437	$11,215	$11,412	$12,381	$13,022	$12,595
Chief Traveling Auditor			A-155-B	7,397	7,492	7,688	8,355	8,735	8,928	9,283
Chief Accountant			A-155-B	1,341	1,451	1,681	1,669	2,097	2,214	2,107
Proportion of Undistributed			A-155-B	3,735	4,476	4,623	4,778	5,162	5,511	5,509
Proportion of Administration			A-155-B	806	764	881	988	940	951	1,011
Total Allowed—Line 7				$22,752	$24,620	$26,088	$27,202	$29,315	$30,626	$30,505

The partial amounts disallowed on lines 15, 17, 19 and 20 are detailed on Appendix "I".

APPENDIX I

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

DETAILS OF PARTIAL AMOUNTS OF A. T. & T. COMPANY DEPARTMENTAL EXPENSES DISALLOWED FOR EACH YEAR FROM 1925 TO 1931, BOTH INCLUSIVE.

	Reference To Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Development and Research—Dept. No. 2								
Picture Transmission	A-118-B	.....	$5,989	$5,911	$4,188	$3,458	$4,321	$7,406
Television	A-118-B	.....	1,324	10,067	3,339	5,519	3,717	3,270
Radio and Subm. Cable Tele. Conn. Eq. & Ccts.	A-118-B	.....	.....	.....	.....	.....	14,961	11,339
Radio Transmission Systems	A-118-B	30,397	35,252	43,571	44,529	66,611	83,203	46,424
Vacuum Tubes	A-118-B	9,216	12,389	11,469	12,812	11,206	14,333	14,903
Photo Electric Cells	A-118-B	.....	1,078	620	1,222	1,415	1,251	2,920
Submarine Cable	A-118-B	.....	.....	3,898	3,643	21,095	27,298	15,804
Total Disallowed—Appendix "H" Line 15		$39,613	$56,032	$75,536	$69,733	$109,304	$149,084	$102,068
Personnel—Dept. No. 4								
Special Training	A-150-B	2,746	2,934	2,393	2,605	2,888	2,885	2,276
"Other" Items Shown in Col. 4	A-150-B	1,419	1,619	1,504	1,591	1,740	1,652	1,224
Public Relations	A-150-B	599	611	610	636	703	683	638
"Other" Items Shown in Col. 4	A-151-B	748	1,071	1,206	1,364	1,447	1,625	1,536
Interest on Empl. Benefit Fund	Heiss No. 10 Supl.	3,608	3,618	2,063	.....	.....	.....	.....
Total Disallowed—Appendix "H" Line 17		$9,120	$9,853	$7,776	$6,196	$6,778	$6,845	$5,674
Treasurer—Dept. No. 6								
Direct Distribution of Securities	Ill. N. R. 861	2,133	16,587	2,993	22,201	15,478	36,456	5,033
Servicing Securities	Ill. N. R. 864	28,868	29,489	29,671	31,548	36,976	41,903	40,169
Handling Funds and Making Advances	Ill. N. R. 863	2,483	2,506	3,133	3,285	3,617	4,111	4,274
Financing General Department	Ill. N. R. 862	1,616	1,631	2,039	2,137	2,354	2,675	2,782
Handling Employees' Stock Plan	Ill. N. R. 862	425	658	1,932	2,095	1,393	6,629	6,691
Total Disallowed—Appendix "H" Line 19		$35,525	$50,871	$39,768	$61,266	$59,818	$91,774	$58,949
Comptroller—Dept. No. 7								
General Books and Records	A-155-B	4,942	5,367	5,957	6,432	7,100	7,926	7,850
Chief Statistician	A-155-B	10,205	11,032	12,207	13,455	14,353	15,090	14,242
Bell System Reports	A-155-B	3,033	3,001	3,088	3,311	3,358	3,421	2,918
Proportion of Undistributed	A-155-B	3,735	4,481	4,774	5,169	5,516	6,031	5,745
Proportion of Administration	A-155-B	806	766	910	1,069	1,006	1,040	1,055
Total Disallowed—Appendix "H" Line 20		$22,721	$24,647	$26,936	$29,436	$31,332	$33,508	$31,810

APPENDIX J

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

TOTAL A. T. & T. COMPANY DEPARTMENTAL EXPENSES AND FAIR PROPORTION THEREOF ALLOCABLE TO THE OHIO BELL TELEPHONE COMPANY AS SHOWN ON PAGE 223 OF COMPANY'S BRIEF FOR EACH YEAR FROM 1925 TO 1931, BOTH INCLUSIVE, AS CLAIMED BY COMPANY

	Dept. No.	Reference to Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Total Departmental Expenses		A-103 & 170-B	$2,963,159	$3,301,306	$3,562,940	$3,813,983	$4,102,105	$4,340,568	$4,234,967
1. Operation and Engineering	No. 1	A-117-B	3,402,573	4,130,418	5,182,815	5,289,081	6,738,114	9,260,867	8,655,309
2. Development and Research	No. 2	A-124-B	738,027	854,747	786,989	1,031,629	1,344,765	1,349,439	1,305,136
3. Information	No. 3	A-150 & 151-B	603,523	707,960	938,415	924,418	1,056,306	1,100,273	1,080,695
4. Personnel	No. 4	A-153-B	26,252	25,860	25,850	26,038	32,987	45,405	35,317
5. Public Relations	No. 5	A-154-B	888,219	1,298,847	1,096,942	1,549,332	1,495,599	2,349,694	1,553,145
6. Treasurer	No. 6	A-155-B	1,117,884	1,241,284	1,341,620	1,410,248	1,488,481	1,619,429	1,607,471
7. Comptroller	No. 7	A-156-B	59,725	62,817	60,452	65,040	65,881	64,965	53,526
8. Secretary	No. 8	A-157-B	706,094	710,799	826,665	726,324	763,731	726,445	666,682
9. Administrative, incl. Sundry	No. 9	A-158-B	345,309	406,307	418,879	442,702	482,643	527,394	491,918
10. General Service Bureau	No. 10	A-159-B	211,565	240,549	233,029	254,250	268,793	277,792	273,631
11. Operation—General	No. 11	A-160-B	668,165	659,735	720,319	936,315	591,505	861,264	817,142
12. Legal	No. 12								
13. Total			$11,730,495	$13,640,629	$15,134,915	$16,469,360	$18,430,910	$22,523,535	$20,774,941
Allocable to the Ohio Bell Tel. Co.		A-108-B	$121,300	$131,722	$141,563	$154,161	$168,039	$176,470	$164,528*
14. Operation and Engineering	No. 1	A-117-B	140,000	165,000	207,000	217,000	270,000	380,000	338,000
15. Development and Research	No. 2	A-124-B	31,184	35,103	31,514	41,441	55,377	54,324	52,365
16. Information	No. 3	A-150 & 151-B	23,944	27,379	36,348	36,978	41,623	42,136	39,560
17. Personnel	No. 4	A-153-B	1,129	1,086	1,086	1,120	1,444	1,932	1,483
18. Public Relations	No. 5	A-154-B	36,131	51,551	40,982	62,224	60,937	93,055	60,209
19. Treasurer	No. 6	A-155-B	45,473	49,267	53,024	56,638	60,647	64,134	62,315
20. Comptroller	No. 7	A-156-B	2,389	2,453	2,348	2,571	2,639	2,527	2,088
21. Secretary	No. 8	A-157-B	28,722	28,212	32,671	29,171	31,117	28,769	25,845
22. Administrative, incl. Sundry	No. 9	A-158-B	14,046	16,126	16,555	17,780	19,665	20,886	19,070
23. General Service Bureau	No. 10	A-159-B	8,694	9,682	9,349	10,113	10,857	11,147	10,071
24. Operation—General	No. 11	A-160-B	27,383	26,354	28,075	36,140	23,222	33,062	31,437
25. Legal	No. 12								
26. Total			$480,295	$543,935	$600,515	$665,337	$745,567	$908,442	$806,921*

NOTE—The portions of lines 14 to 26, inclusive, which are allowed and disallowed are shown on Appendix "H".
*$10,000.00 added to correct error in figures shown in Company's brief.

APPENDIX K

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3367

DEPRECIATION EXPENSE ALLOWED ON DEPRECIABLE FIXED CAPITAL FOR EACH YEAR FROM 1925 TO 1933 BOTH INCLUSIVE

	June 30, 1925	Last 6 Mos. 1925	Year 1926	Year 1927	Year 1928
Total Fixed Capital—					
1. Final Present Value Fixed by Commission—Appendix "A"	$93,473,774	.....	.....	.....	.....
2. Net Additions During Period—Per Books	.....	$5,498,201	$7,472,534	$17,053,219	$11,043,418
Non-Depreciable Fixed Capital—					
3. Right of Way	1,243,064	66,642	2,831*	1,648	80,481
4. Land	3,256,854	69,276	11,111	163,237	765,893
5. Station Installations	1,627,538	69,908	197,122	349,079	281,111
6. Interior Block Wires	67,105	345	789	8,966	8,383
7. Drop Wires	1,232,185	.....	Not Available from Record		.....
8. General Store Equipment	15,454	825	1,712	2,525	2,825
9. General Stable and Garage Equipment	489,248	99,494	81,398	64,726	129,175
10. General Tools and Implements	295,436	33,818	157,394*	34,153	62,495
11. Undistributed Construction Expenditures	916,026	.....	Not Available from Record		.....
12. Total Non-Depreciable Property	9,142,880	339,[illegible]38	131,917	524,394	1,330,363
Depreciable Fixed Capital—					
13. Net Additions During Period—Line 2 less Line 12	.....	5,15[illegible],[illegible]63	7,340,617	16,528,885	9,713,056
14. Balance First of Period—From Line 15	.....	84,330,894	89,489,287	96,829,904	113,358,789
15. Balance End of Period—Line 13 plus Line 14	84,330,894	89,489,287	96,829,904	113,358,789	123,071,845
16. Average During Period Based Upon Lines 14 and 15	84,330,894	.....	93,159,596	105,094,347	118,215,317
Depreciation Expense—	(Year 1925)				
17. At 4% of Line 16	3,373,236	.....	3,726,384	4,203,774	4,728,613

	Year 1929	Year 1930	Year 1931	Year 1932	Year 1933
Total Fixed Capital—					
18. Final Present Value Fixed by Commission—Appendix "A"	.....	.....	.....	.....	.....
19. Net Additions During Period—Per Books	14,594,896	13,680,846	3,766,660	2,626,683*	1,286,070*
Non-Depreciable Fixed Capital—					
20. Right of Way	78,604	133,458	30,198	39,689	31,741*
21. Land	768,559	561,745*	39,578*	49,461*	61,222
22. Station Installations	353,710	71,532	29,331	296,308*	527,558*
23. Interior Block Wires	8,013	7,182	7,770	1,049*	
24. Drop Wires	.....	Not Available from Record		.....	.....
25. General Store Equipment	4,083	6,996*	1,911*	955*	105,785*
26. General Stable and Garage Equipment	102,866	142,528*	121,464*	141,094*	
27. General Tools and Implements	101,475	96,292*	53,468*	38,600*	
28. Undistributed Construction Expenditures	.....	Not Available from Record			.....
29. Total Non-Depreciable Property	1,417,310	595,886*	149,123*	487,778*	603,857*
Depreciable Fixed Capital—					
30. Net Additions During Period—Line 19 less Line 29	13,177,586	14,276,232	3,915,783	2,138,905*	682,213*
31. Balance First of Period—From Line 32	123,071,845	136,249,431	150,525,663	154,441,445	153,302,540
32. Balance End of Period—Line 30 plus Line 31	136,249,431	150,525,663	154,441,445	152,302,540	151,620,327
33. Average During Period Based Upon Lines 31 and 32	129,660,638	143,387,547	152,483,554	153,371,993	151,961,434
Depreciation Expense—					(Year 1933)
34. At 4% of Line 33	5,186,426	5,735,502	6,099,342	6,134,880	6,078,457

NOTE—Depreciation Expense on Station Installations, Interior Block Wires and Drop Wires (Lines 5-7 and 22-24) has been allowed as charged on the books to Maintenance Acct. 607—Station Removals and Changes. Depreciation Expense on General Store Equipment, General Stable and Garage Equipment and General Tools and Implements (Lines 8-10 and 25-27) has been allowed as charged on the books to Maintenance Expenses and Gross Additions to Plant. Therefore, these items are treated above as Non-Depreciable for purposes of computing the specific allowable depreciation expense chargeable to Acct. 608—Depreciation of Telephone Plant and Equipment.

Prior to the re-classification of accounts to conform with the revised I. C. C. regulations effective January 1, 1933, specific changes in Drop Wires (Lines 7 and 24), and undistributed construction expenditures (Lines 11 and 28) were not available from the record, and therefore, have not been considered in the above computations.

*Indicates red figures.

The amounts on Lines 17 and 34 are forwarded to Appendix "F", Lines 10 and 29.

APPENDIX L

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

BASIS OF INTERSTATE AND INTRASTATE ALLOCATIONS FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE.

	1925		1926		1927		1928	
	Interstate	Intrastate	Interstate	Intrastate	Interstate	Intrastate	Interstate	Intrastate
Valuation								
1. Total Property	2.81552%	97.18448%	3.10771%	96.89229%	3.84204%	96.15796%	4.27597%	95.72403%
Revenues								
2. Exchange Service Revenues	1.11547%	98.88453%	1.14462%	98.85538%	1.21741%	98.78259%	1.22261%	98.77739%
3. Toll Service Revenues	11.23491%	88.76509%	11.38596%	88.61405%	12.20280%	87.79720%	12.23532%	87.76468%
4. Miscellaneous Operating Revenues	4.80362%	95.60638%	5.42327%	94.56673%	4.16569%	95.83431%	4.67220%	95.32780%
5. Licensee Revenues—Debit	2.85771%	97.14229%	3.04000%	96.96000%	3.23000%	96.77000%	3.37102%	96.62898%
6. Net Non-Operating Revenues	16.60906%	83.39094%	27.58787%	72.41213%	66.87833%	33.12167%	57.63816%	42.36184%
Expenses								
7. Current Maintenance Expenses	2.45677%	97.54323%	2.76813%	97.23187%	3.14391%	96.85609%	3.29655%	96.70345%
8. Depreciation of Tel. Plant and Equip.	2.78127%	97.21873%	2.97288%	97.02712%	3.46989%	96.53011%	3.78570%	96.21430%
9. Traffic Expenses	3.57894%	96.42106%	3.89936%	96.10064%	4.29704%	95.70296%	4.47149%	95.52851%
10. Commercial Expenses	3.13213%	96.86787%	3.28496%	96.71504%	3.67148%	96.32852%	4.03404%	95.96596%
11. General and Miscellaneous Expenses	2.95997%	97.04003%	3.27000%	96.73000%	3.82996%	96.17002%	4.15883%	95.84117%
12. Uncollectable Operating Revenues	3.06387%	96.94613%	3.29000%	96.71000%	3.48000%	96.52000%	3.60558%	96.39447%
13. Taxes Assignable to Operations	2.72836%	97.27164%	2.86136%	97.13865%	3.52844%	96.47156%	3.92022%	96.07978%
14. Rent Deductions	4.84909%	95.15091%	5.29356%	94.70644%	7.58333%	92.46665%	8.48018%	91.56982%
15. W. E. Co. Excess Profits—Credit								

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

BASIS OF INTERSTATE AND INTRASTATE ALLOCATIONS FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE—CONCLUDED.

	1929		1930		1931		1932		1933
	Interstate	Intrastate	Interstate	Intrastate	Interstate	Intrastate	Interstate	Intrastate	
Valuation									
1. Total Property	4.74851%	95.25149%	4.95285%	95.04715%	5.55129%	94.44871%	5.36561%	94.63439%	
Revenues									
2. Exchange Service Revenues	1.29078%	98.69222%	1.29591%	98.70409%	1.35540%	98.64460%	1.14950%	98.85050%	
3. Toll Service Revenues	12.17252%	86.82748%	12.10806%	86.89194%	12.91621%	86.08379%	12.08514%	87.91486%	
4. Miscellaneous Operating Revenues	20.71110%	69.28890%	26.29338%	73.70662%	31.96198%	68.03802%	31.75707%	68.24293%	
5. Licensee Revenues—Debit	3.73000%	96.27000%	3.49000%	96.51000%	3.81000%	96.19000%	2.80000%	97.20000%	
6. Net Non-Operating Revenues		100.00000%		100.00000%		100.00000%		100.00000%	Same Percentages Used as for 1932
Expenses									
7. Current Maintenance Expenses	3.48588%	96.51412%	3.13026%	96.86974%	3.13050%	96.86950%	2.75396%	97.24704%	
8. Depreciation of Tel. Plant and Equipment	4.29229%	95.70771%	4.80549%	95.69451%	4.82256%	95.17745%	4.51320%	95.48680%	
9. Traffic Expenses	4.98788%	95.01217%	5.01835%	94.98165%	5.41812%	94.58688%	4.85801%	95.14199%	
10. Commercial Expenses	4.81189%	95.18811%	4.55564%	95.44436%	4.52562%	95.47438%	3.24141%	96.75859%	
11. General and Miscellaneous Expenses	4.58004%	95.41996%	4.68000%	95.32000%	4.94000%	95.06000%	4.80000%	95.20000%	
12. Uncollectable Operating Revenues	4.85000%	95.15000%	4.52000%	95.48000%	4.81000%	95.19000%	4.14000%	95.86000%	
13. Taxes Assignable to Operations	4.51408%	95.48592%	4.86751%	95.13249%	5.10650%	94.89350%	4.48778%	95.52222%	
14. Rent Deductions	9.11909%	90.88091%	8.42887%	91.57113%	8.26492%	91.73508%	4.75709%	95.24291%	
15. W. E. Co. Excess Profits—Credit			8.76163%	91.23837%	4.06006%	95.93994%	3.67949%	96.32051%	

NOTE:
The Above Percentages Were Computed from the Following Information Furnished by the Company:—
Brett Exhibit No. 1.
Eide Exhibit No. 8.
Supplemental Data Furnished with Letter from Karl Burr Dated September 20, 1933.
Statement No. 7 Furnished June 14, 1933.

APPENDIX M

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

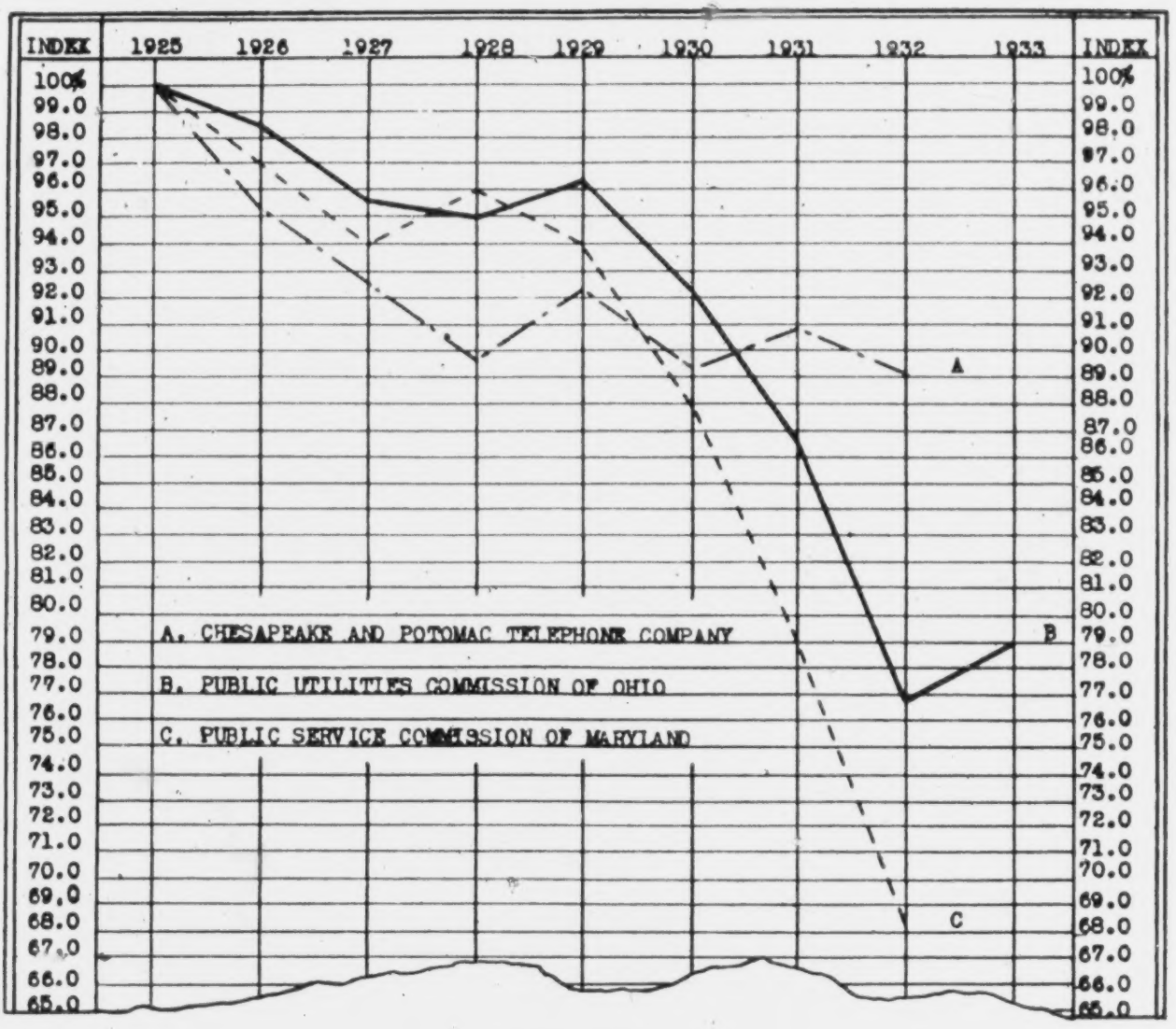
RATE STUDY FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE

	Realized Return as Found by Comm'n			Return Considered as Fair by Commission		Excessive Return as Found by Commission	
	Valuation Appendix "A" & "B"	Net Income Appendix "F"	Rate of Return	Rate	Amount	Rate	Amount
Total for Ohio							
1. Year 1925	$96,422,276	$8,681,822	9.00%				
2. Year 1926	105,061,860	9,500,571	9.05%				
3. Year 1927	115,473,043	10,214,020	8.85%				
4. Year 1928	127,886,107	10,969,022	8.58%				
5. Year 1929	141,483,956	11,567,856	8.18%				
6. Year 1930	153,274,508	11,511,831	7.51%				
7. Year 1931	153,810,108	11,712,432	7.61%				
8. Year 1932	141,202,004	8,652,192	6.13%				
9. Year 1933	133,408,379	7,347,798	5.51%				
10. Average	$129,776,915	$10,017,505	7.72%				
Interstate							
11. Year 1925	$2,714,788	$299,651	11.04%				
12. Year 1926	3,264,086	335,344	10.27%				
13. Year 1927	4,436,521	454,853	10.25%				
14. Year 1928	5,468,372	474,480	8.68%				
15. Year 1929	6,718,380	670,919	9.99%				
16. Year 1930	7,591,456	560,744	7.39%				
17. Year 1931	8,538,445	610,014	7.14%				
18. Year 1932	7,576,349	394,446	5.21%				
19. Year 1933	7,158,173	388,566	5.43%				
20. Average	$5,940,730	$465,446	7.83%				
Intrastate							
21. Year 1925	$93,707,488	$8,382,171	8.95%	7.0%	$6,559,524	1.95%	$1,822,647
22. Year 1926	101,767,774	9,165,227	9.01%	7.0%	7,123,744	2.01%	2,041,483
23. Year 1927	111,036,522	9,759,167	8.79%	7.0%	7,772,557	1.79%	1,986,610
24. Year 1928	122,417,735	10,494,542	8.57%	7.0%	8,569,241	1.57%	1,925,301
25. Year 1929	134,765,576	10,896,987	8.09%	7.0%	9,433,590	1.09%	1,463,847
26. Year 1930	145,683,047	10,951,087	7.52%	6.5%	9,469,398	1.02%	1,481,689
27. Year 1931	145,271,663	11,102,418	7.64%	6.5%	9,442,658	1.14%	1,659,760
28. Year 1932	133,625,655	8,257,746	6.18%	5.5%	7,349,411	.68%	908,335
29. Year 1933	126,250,206	6,959,232	5.51%	5.5%	6,959,232	.....	.....
30. Average	$123,636,165	$9,552,059	7.71%	6.5%	$8,075,484	Total	$13,289,172

APPENDIX N

THE OHIO BELL TELEPHONE COMPANY - FORMAL CASE NO. 3307

COMPARISON OF COMPOSITE TRENDS DEVELOPED IN THIS CASE (NO. 3307) WITH COMPOSITE TRENDS DEVELOPED IN THE CASE OF THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND (NO.3424)



PERCENTAGES

* A.	100.0%	95.3%	92.7%	89.6%	92.2%	89.1%	90.8%	89.1%	
B.	100.0%	98.7%	95.7%	95.0%	96.3%	92.2%	86.6%	76.8%	79.1%
* C.	100.0%	97.0%	94.0%	96.0%	94.0%	88.0%	79.0%	68.4%	

Note:-

In applying the trends in this case, the percentages on Line "B" above, which are all based upon 1925, have been used in computing the following percentages which reflect the trend for each individual year based upon investment at the end of the preceding year. 1926, 98.73% of 1925; 1927, 96.97% of 1926; 1928, 99.20% of 1927; 1929, 101.45% of 1928; 1930, 95.65% of 1929; 1931, 93.95% of 1930; 1932, 88.71% of 1931 and 1933, 102.96% of 1932.

Authorities used in computing the percentages on Line "B" above are explained in the opinion.

* These percentages have been recomputed for comparative purposes, using 1925 as 100%.

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In the Supreme Court of the United States

OCTOBER TERM, 1936.

No. 539.

THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

THE PUBLIC UTILITIES COMMISSION OF OHIO,
Appellee.

APPEAL FROM THE SUPREME COURT OF OHIO.

APPELLANT'S BRIEF.

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W. H. THOMPSON,
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ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Counsel for Appellant.

CHARLES M. BRACELEN,
Of Counsel.

THE GATES LEGAL PUBLISHING CO., CLEVELAND, OHIO

In the Supreme Court of the United States

OCTOBER TERM, 1936.

No. 539.

THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

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Appellee.

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THE PUBLIC UTILITIES COMMISSION OF OHIO,
Appellee.

APPELLANT'S BRIEF.

NATURE OF CASE.

Appellant, The Ohio Bell Telephone Company, seeks to reverse a judgment of the Supreme Court of Ohio entered against it on July 22, 1936, affirming orders of the Public Utilities Commission of Ohio of January 16, March 1, July 5 and 9, and September 6, 1934.

An application for rehearing (R. 585), seasonably filed, was overruled by that Court October 7, 1936. (R. 7.)

Separate petitions in error were filed by appellant in the Supreme Court of Ohio to review directly in that Court, pursuant to Sections 544 *et seq.* of the General Code, the orders of the Commission referred to. (R. 87, 435, 482, 501.) The petitions in error were consolidated into one case (R. 3; 533), briefed and argued as such, decided in one opinion (R. 533) and by the entry of the one judgment. (R. 7.)

The orders complained of were entered in a company-wide case instituted by the Commission on October 14, 1924 to determine (a) the fair value of appellant's intrastate property and (b) its reasonable rates. (R. 714.)

There were consolidated with the company-wide case 31 pending cases in which increases in the rates for a part

of its service in certain exchanges and in its toll system had been put into effect and were being collected by appellant under statutory bonds. (R. 714.) The Commission's orders fixed values for appellant's property for the years 1925 to 1933, inclusive, required appellant to refund to its exchange subscribers and toll patrons an aggregate amount of $11,832,264 of claimed excess earnings for the years 1925 to 1932, inclusive, found that appellant had had no excess earnings for 1933 and ordered no refunds for that year, but did not fix appellant's rates for the future.

The Supreme Court of Ohio approved the findings and affirmed the orders of the Commission in their entirety. (R. 7; 585.)

OPINIONS IN THE CASE.

None of the Commission's orders is reported, but the opinion and findings accompanying the order of January 16, 1934, with the dissenting opinion of the Chairman, are reported in 2 Public Utilities Reports (N.S.) 113.*

The opinion of the Supreme Court of Ohio is reported in 131 Ohio State Reports, pages 539 to 602, and in 3 N. E. (2d) 475 to 501. (R. 533.)

Appellant's application for rehearing was overruled without opinion.

JURISDICTION.

Pursuant to Rule 12 of this Court, appellant filed a statement showing the grounds upon which it invoked the jurisdiction of this Court under Section 237 of the Judicial Code.

Probable jurisdiction has been noted by this Court.

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* The findings and orders of the Commission complained of are contained in the Record as follows: The findings and order of January 16, 1934 at pages 154 *et seq.*; of March 1, 1934 at pages 273 *et seq.*; of July 5, 1934 at pages 303 *et seq.*; of July 9, 1934 at pages 308 *et seq.* and of September 6, 1934 at pages 372 *et seq.* They are summarized at pages 4 to 12, *infra*. The order of September 6, 1934 is also included in the Appendix hereto, p. xix.

STATEMENT OF THE CASE.

Appellant, a public utility, owns and operates a local and long distance telephone system in Ohio. It was organized September 20, 1921, by the consolidation of the Ohio State Telephone Company and the former Ohio Bell Telephone Company. In the Commission's order approving the consolidation appellant was required to furnish a unified service, combining the services of the two former companies in those cities where the two companies had theretofore furnished competing services. (Company Ex. X-3, R. 6358-9.) The consolidation was the outcome of a widespread demand for the elimination of dual telephone service in Ohio, culminating in a resolution of the Ohio legislature memorializing Congress to legalize such consolidations. (Company Ex. A, R. 6356.)

During the period of the Commission's investigation appellant's rate schedules were of two kinds, (a) schedules of increased rates filed with the Commission, protested, and made effective under separate bonds, limited to the repayment of such portion of the increase as the Commission might find to be excessive, as provided by the Robinson and Pence laws,* and, (b) schedules filed with the Commission, becoming effective without protest or bond, (R. 53; 56; 61-2; 8429-8574) and not subject to refund.

In 1924, when the company-wide case was commenced, there were pending thirty-one separate cases in which increases in appellant's rates for parts of its services in exchanges and in its toll system had thus been made effective under separate bonds. Thereafter additional increases were made effective in like manner. At the time of the Commission's orders forty-six such separate bond cases

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* 108 Ohio Laws 1094 and 110 Ohio Laws 366, since repealed, but with saving clauses. Inasmuch as the two laws are identical in their applicability to the present case, references hereafter to the Pence law (Appendix *infra* p. i) are intended to include both laws.

were pending, all consolidated with the company-wide case. (R. 53-82; 714; 378.)

Each statutory bond provided for the repayment of:

> "such portion of such increased rates • • • as the Commission, upon final hearing, may determine to have been unreasonable or excessive, • • •." (R. 56; 80.)

On October 14, 1924, before the trial of any bond case had been concluded, the Commission on its own motion ordered a company-wide investigation of appellant's property and rates and consolidated the bond cases therewith. The order recited that in all the pending bond cases important issues, common to all of the cases, could best be determined in a single consolidated case. (R. 716.)

Pursuant to Section 499-9 of the General Code, the Commission adopted June 30, 1925, as the "date certain" for the purpose of valuing appellant's property. (R. 126; 166.)

Commission's Orders.

The following is a general description of the Commission's orders:

Order of January 10, 1931
Fixing Tentative Value.

The order of January 10, 1931 (R. 121; 144) was entered after submission of the case upon evidence, briefs and oral argument in behalf of appellant and the state. It fixed the value of appellant's entire property, interstate and intrastate, as of June 30, 1925, the date certain. (R. 145.) This value is commonly referred to as "tentative" because interested parties have the right of protest before it becomes final. Both appellant and the state having filed protests against it, the value did not become final and therefore no petition in error was filed to review it.

Order of January 16, 1934 Fixing Final Value.

In the order of January 16, 1934 (R. 154; 247) the Commission disposed of the protests and determined for each of the years 1925 to 1933 the amount by which appellant's earnings from its entire intrastate business, toll and exchange, exceeded a fair return on the value of its intrastate property. To do this the Commission found for each year, with respect to the intrastate business and property as an entirety:

First, the value of the property.

Second, the fair rate of return.

Third, the dollar amount of such return.

Fourth, the revenues, adjusted expenses (after disallowing large amounts of the expense of depreciation and license contract services) and the resulting net income.

Fifth, the amount by which the resulting net income exceeded the fair return on the property value fixed by the Commission.

By years, the amounts of the excess earnings were found to be as follows:

1925	$1,822,647
1926	2,041,483
1927	1,986,610
1928	1,925,301
1929	1,463,347
1930	1,481,689
1931	1,659,760
1932	908,335
1933	Nothing
Total	$13,289,172

In the order the Commission indicated its intention to require the refund of this entire sum.

Intermediate Orders.

The orders of March 1, July 5, and July 9, 1934 were in the nature of show-cause orders. (R. 273; 303; 308.)

Order of September 6, 1934
Fixing Refunds.

The order of September 6, 1934 (R. 372) was the final order in respect of refunds. Recognizing that a part of the $13,289,172 of excess earnings found in the order of January 16, 1934 was referable to non-bonded rates which, under the law of Ohio, could not be ordered refunded, the Commission in its order of September 6, 1934, by an apportionment designed to exclude the non refundable portion, fixed the amount to be refunded to appellant's exchange subscribers and toll patrons as follows:

	Exchange	Toll
1925	$ 1,137,195	$232,282
1926	1,637,314	176,845
1927	1,823,857	Nothing
1928	1,772,238	"
1929	1,344,624	"
1930	1,357,589	"
1931	1,519,405	"
1932	830,915	"
1933	Nothing	"
Total	$11,423,137	$409,127

The amount ordered refunded for each year was fixed by an apportionment based on gross exchange revenues, as follows: first, by finding the percentage relation of the gross exchange revenues of the exchanges where one or more of the exchange rates were increased under bond (even though in many instances only a few of the rates in such exchanges were bonded), to appellant's total gross exchange revenues for that year; and second, by applying the resulting percentage to the excess earnings from appel-

lant's entire intrastate business found for such year, the resulting amount being ordered refunded to the subscribers whose rates had been increased under bond. (Commission's witness, Wood, R. 3738-57; 3760-76; 3797-3800; Appellant's witness, Brett, R. 3776-96; Wood Exs. 21 and 22 and Wood reports of Aug. 11, 1934; R. 8193-8212.)

Summary of Commission's Findings and Orders.

(1) The Commission's order of January 10, 1931 had tentatively fixed the value of appellant's total property, interstate and intrastate, as of the "date certain" (June 30, 1925) at $104,282,735, of which $101,346,634 represented the intrastate portion on the basis of the separation later adopted by the Commission. (R. 145.)

The Commission's order of January 16, 1934 fixed the final value of the intrastate portion of the property at $93,707,488 as of June 30, 1925. This value was arrived at by eliminating the interstate portion, and by making reductions of $7,860,459 in the tentative value. (R. 196; 247.) The intrastate portions of the reductions, aggregating $7,639,146, were:

$316,090 on account of right-of-way;
$535,970 on account of working capital;
$3,296,181 on account of undistributed construction costs; and
$3,490,905, its previous allowance for going concern value.

(2) The only finding of value based on an inventory and appraisal was that of June 30, 1925.

(3) For each succeeding year, 1926 to 1933, the Commission fixed the final value of appellant's intrastate property by applying a single price trend percentage to the value for the preceding year and then adding the net additions. (R. 187-9; 232.) By this process the Commission fixed values as follows:

1926	$101,767,774	1930	$145,683,047
1927	111,036,522	1931	145,271,663
1928	122,417,735	1932	133,625,655
1929	134,765,576	1933	126,250,206.

(R. 232.)

(4) The trend percentages, related in each year to the value found for the preceding year, were:

1926	98.73% of 1925	1930	95.65% of 1929
1927	96.97% of 1926	1931	93.93% of 1930
1928	99.20% of 1927	1932	88.71% of 1931
1929	101.45% of 1928	1933	102.96% of 1932

(R. 232.)

These percentages, the Commission said, "represent the relation of values for each current period to the preceding period • • •." (R. 232.)

(5) Related to 1925, the trend percentages were:

1926	98.7%	1930	92.2%
1927	95.7%	1931	86.6%
1928	95. %	1932	76.8%
1929	96.3%	1933	79.1%

(R. 245.)

(6) The price trends were based upon information obtained from various sources without appellant's knowledge and not offered or introduced in evidence. With respect to the sources of this information the Commission said:

(a) "A study was made of the cost prices furnished by manufacturers of telephone equipment over the several years";

(b) "The trend of land valuation was ascertained from examination of the tax value in communities where the company had its largest real estate holdings, confining such to urban property only";

(c) "For building trends resort was had to prices (*sic*) indices of the *Engineering News Record*, a recog-

nized magazine in the field of engineering construction";

(d) "Labor trends were developed from the same sources";

(e) "Resort was also had to the finding of the Statutory Court in the Chicago case and its study of price level of sales of the Western Electric Company." (R. 188.)

The record does not otherwise disclose the sources of or any details concerning the price trend information, what weighting was given to the information, how it was compiled, or the method of its application.

Appellant's repeated requests (R. 273; 312; 382-3) to inspect and rebut the information were denied. (R. 275; 373; 722.)

(7) Appellant made a separation of its property, revenues and expenses as between its interstate and intrastate business on the basis of use. (R. 3225-58; 3267-72; Wilson Exs. 1 and 2; R. 8168-9; Brett Ex. 1, R. 6313-6.) The Commission found that appellant's intrastate property was the following percentage of its total property by years:

1925, 97.18448%;	1928, 95.72403%;	1931, 94.44871%;
1926, 96.89229%;	1929, 95.25149%;	1932, 94.63439%;
1927, 96.15796%;	1930, 95.04715%;	1933, 94.63439%.

(R. 243.)

The Commission accepted the separation so made of appellant's property, revenues and expenses. (R. 164.) No question in respect thereof was raised in the Supreme Court of Ohio and it is agreed by the Commission that none will be raised here. (R. 51.)

(8) The final findings of value for 1925, 1926, 1927, and 1928 contained no allowance for parcels of land, purchased as sites for telephone exchange buildings. (R. 160; 233.) The value of these parcels was:

$586,959 for 1925
$550,962 for 1926
$ 95,241 for 1927
$ 53,646 for 1928. (R. 233.)

(9) Except for an increase of approximately 10% effective November 1, 1930, the Commission approved the prices paid by appellant to Western Electric Company for telephone apparatus as fair throughout the period under investigation. (R. 165-9.) The Commission also found that Western's profits in its Bell System business were reasonable. (R. 166; 168.) The Commission's order does not disclose what weighting was given to Western's prices in the trended values of appellant's property for the years 1926 to 1933. It does show that it approved Western's reductions in prices but did not approve the increase referred to. (R. 169.)

(10) The Commission found that at the date certain there was 13.18% of existing depreciation in appellant's intrastate property and accordingly deducted $14,226,709, from its reproduction cost new. (R. 231.) It made no finding on the subject of existing depreciation for 1926 and subsequent years. The depreciated value found for the date certain was trended for the subsequent years with yearly net additions added at cost, undepreciated. (R. 232.)

(11) In respect of the annual expense of depreciation, the Commission found that appellant's retirement losses from September 20, 1921 to June 30, 1925, a period of three years and nine months immediately preceding the date certain, averaged annually 3.74% of the undepreciated cost of appellant's depreciable property. (R. 201-3.) It then stated that for the period under investigation it had allowed a composite annual rate of 4% for that expense. (R. 203.) For the year 1925 it applied the 4% depreciation rate to reproduction cost new less existing deprecia-

tion. For that year, the reproduction cost new (depreciable intrastate property) was $94,964,521. (R. 231; 234; 242.) The allowance for depreciation expense was $3,279,417. (R. 204; 236; 242.) The allowance therefore was only 3.45% of the undepreciated reproduction cost.

It refused to base its allowance for the annual expense of depreciation upon appellant's depreciation rates which appellant proved by classes of plant. (R. 1390-1405; 3212-4; 3216-23; 3640-73; Schneider Exs. 4 to 13 inclusive, and Schneider Ex. 21; R. 7229-39; 7241.) It allowed for this expense for the years 1925 to 1933 inclusive, the period under investigation, $8,067,266 less than appellant's actual intrastate retirement losses during that period. (See table, page 40, *infra.*)

(12) American Telephone and Telegraph Company furnished to appellant and other Bell Associate Companies license contract services for which appellant annually paid a stated percent of its gross revenues for services received by it. Prior to 1926 the percent was 4½. After successive reductions, the payment was fixed on January 1, 1929 at 1½%, where it has since remained. (R. 204.)

The services included assistance and advice in engineering, plant, traffic, operating, commercial, accounting, patent, legal, financial, administrative and other matters relating to appellant's business. (R. 206-7.)

The Commission disallowed a part of the costs incurred in rendering these services. The disallowances were based upon the Commission's finding that the services were either (a) of no benefit to appellant, or (b) incurred by the American Company for its own benefit as a holding company. (R. 211; 210-19.)

Because of such disallowances the Commission deducted from appellant's intrastate operating expenses the following amounts:

1925.....	$732,429	1929.....	$175,773
1926.....	682,004	1930.....	100,906
1927.....	741,006	1931.....	94,350
1928.....	320,448	1932.....	23,302
		Total	$2,870,218

(R. 210-9; 238-41; Appendix hereto, pages xi-xvii.)

(13) It allowed as fair rates of return, 7% for each of the years 1925 to 1929, inclusive; 6½% for 1930 and 1931, and 5½% for 1932 and 1933. (R. 222.)

(14) It found that appellant had excess earnings for each of the years 1925 to 1932, inclusive, aggregating $13,289,172. Of these excess earnings its order of September 6, 1934 required appellant to refund to its exchange subscribers and toll patrons, annual amounts aggregating $11,832,264. (R. 374; 376; 378.) The method by which the excess earnings were fixed and the refundable portion arrived at, is set out at page 6, *supra*.

(15) The Commission found that under its then existing rates, including those increased under bond, appellant had no excess earnings for 1933 and ordered no refunds for that year. (R. 222; 374; 376.)

(16) The Commission's finding of excess earnings for the years 1925 to 1932 was based upon a method which involved the fixing of the value of appellant's entire intrastate property in all of its exchanges and its toll system, as a whole, including exchanges where no increases in rates were collected under bond during the period in controversy. (R. 190.) The Commission, proceeding on this basis, made no finding of property values, revenues, expenses or net income for the exchanges in which increases in rates were collected under bond, either separately or as a group, or for the toll property. It refused to receive proof of such facts offered by appellant. (R. 190; 273; 274; 312; 373; 382; 722; 2944; 2942-5; 2951-2; 8735-6; 8736-8.)

Appellant's Financial Experience.

Under the rates collected, including those increased under bond, appellant had:

(1) A surplus on November 30, 1933, the end of the period under investigation, of $2,813,345 which was nearly $1,000,000 less than the surplus as of June 30, 1925, the first year of the period. (*Infra*, page 78; Wood Ex. 1; R. 8171; 8416.)

(2) Paid dividends on its common stock, from its organization in 1921 to and including 1933, at an average rate of 5.27% per annum. (R. 8364; 8415; 8418; Wood Exs. 1 and 4; R. 8171; 8174.) Appellant's entire capitalization, approved by the Commission, has never exceeded its investment. (Wood Ex. 1; R. 8171; 8361; 8364; 8414; 8415; Uprichard Ex. 4; R. 7397; Eide Ex. 1; R. 6489; 8338.)

(3) A reserve for accrued depreciation which for no year exceeded 12.82% of appellant's total fixed capital or 13.93% of the cost of its intrastate depreciable property. (See table, page 15, *infra*.)

The relation of the reserve to total fixed capital is shown by the following table:

(1) As of June 30	(2) Total Fixed Capital	(3) Reserve for Accrued Depreciation and Amortization of Intangible Capital	(4) Percentage (3 to 2)
1925	$ 98,712,030	$12,560,503	12.72%
1926	108,347,406	12,062,768	11.13
1927	120,846,286	11,808,682	9.77
1928	132,975,578	12,441,734	9.36
1929	145,306,101	14,738,613	10.14
1930	163,560,460	17,377,782	10.62
1931	167,580,606	18,220,463	10.87
1932	171,441,487	20,569,894	12.00
3-31-33	168,740,946	21,627,492	12.82

(Brett Exhibit 6; R. 6332; Eide Exhibits 3 and 4; R. 6531; 6535; and R. 8351.)

In order to show the relation of the reserve to the *intrastate depreciable* property, there has been prepared the following table, which shows for each year, in column (1) the Commission's findings of value; in column (2) the cost of the property plus the Commission's allowance for cash working capital and materials and supplies; in column (3) the cost of the depreciable property; in column (4) appellant's reserve for depreciation resulting from its own accruals; in column (5) the percentage of such reserve to such cost; in column (6) the reserve, recomputed in accordance with the Commission's annual depreciation allowance; in column (7) the percentage of such reserve to such cost, and in column (8) the existing depreciation found by the Commission.

The figures contained in column 1 of the table appear in Appendix B (R. 232) of the Commission's findings of January 16, 1934, Appendix hereto page ix. The finding of existing depreciation, column 8, is found in Appendix A (R. 231) of the Commission's said findings, Appendix hereto page vii. Columns 2, 3, 4 and 6 consist of average figures obtained and compiled from Brett Exhibits 1 and 8, R. 6313; 6333; Eide Exhibit 3, R. 6525; Wood Exhibits 11, 12, 13 and 15, R. 8182; 8183; 8190; finding of January 16, 1934, Appendices B, F and L, R. 232, Appendix hereto p. ix; 236; 243, and R. 8347; 8342; 8352; 8353; 8354; 8355; 8414; 8421; 8425.

	(1) Commission's Value Including Allowance for Working Capital and Supplies	(2) Average Cost plus Commission's Allowance for Working Capital and Supplies
1925	$ 93,707,488	$ 98,798,259
1926	101,767,774	107,424,541
1927	111,036,522	118,526,298
1928	122,417,735	131,597,552
1929	134,765,576	143,380,043
1930	145,683,047	156,319,161
1931	145,271,663	163,153,973
1932	133,625,655	163,723,323
1933	126,250,206	162,403,661

	(3) Average Cost of Depreciable Property	(4) Appellant's Average Reserve for Depreciation at its Rates	(5) Percent of (4) to (3)
1925	$ 87,627,303	$12,156,070	13.87%
1926	96,178,256	12,211,751	12.70
1927	109,503,867	12,049,013	11.00
1928	120,641,748	12,509,865	10.37
1929	128,112,689	13,907,809	10.86
1930	140,909,041	15,812,545	11.22
1931	149,026,163	17,298,870	11.61
1932	149,743,360	19,175,059	12.81
1933	148,320,000	20,655,186	13.93

	(6) Average Reserve Recomputed in Accordance with Commission's Allowance	(7) Percent of (6) to (3)	(8) Commission's Finding of Existing Depreciation
1925	$11,310,960	12.91%	13.18% *
1926	9,615,409	10.00	no finding
1927	7,640,196	6.98	" "
1928	6,212,713	5.15	" "
1929	5,347,981	4.17	" "
1930	4,570,160	3.24	" "
1931	3,259,317	2.19	" "
1932	3,200,905	2.14	" "
1933	3,908,911	2.64	" "

* This figure relates to total intrastate property, depreciable and non-depreciable.

SPECIFICATION OF ASSIGNED ERRORS INTENDED TO BE URGED.

There are fifteen assignments of error. (R. 18.)

All of them support the proposition that the Commission's findings and orders, and the judgment of the Supreme Court of Ohio affirming them, deprive appellant of its property without due process of law and deny it the equal protection of the laws in violation of the Fourteenth Amendment to the Constitution of the United States.

All errors assigned are relied upon except assignments 9 and 10, subdivision (b) of Assignment 12, subdivisions (d) and (e) of Assignment 13, and Assignment 14.* The errors relied on are here summarized in the order in which they will be presented in the argument:

Price Trends. (Argument pp. 25 to 37, *infra.*)

For 1926 to 1933, inclusive, the Commission valued appellant's property solely by the use of price trend percentages, based upon secret information, undisclosed to appellant, not offered or introduced in evidence and which appellant was denied the opportunity to examine or rebut. Upon the valuations so fixed appellant was ordered to refund for those years the sum of $10,462,787 with interest.

These trends the Commission used as a formula of value. It thereby abandoned the exercise of judgment in fixing value, and gave no weight to reproduction cost new. (Assignments of Error 1, 2, 3 and 13(b).)

Expenses. (Argument pp. 37 to 63, *infra.*)

(1) The allowance for the annual expense of depreciation was wholly inadequate. The Commission purported to base the allowance on appellant's retirement experience for the period of three years and nine months immediately pre-

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* The assignments not now relied upon relate to refusal to fix rates for the future, construction work in progress, right-of-way, existing depreciation for 1925, and lack of judicial review.

ceding June 30, 1925, and wholly disregarded appellant's retirement experience during the period under investigation, 1925 to 1933, inclusive. The Commission's allowance was $8,067,266 less than the actual cost of appellant's intrastate plant retirements during that period. The Commission rejected appellant's depreciation rates based on its own experience and established by the undisputed evidence.

(2) For the years 1925 to 1932, inclusive, the Commission erroneously disallowed more than $2,800,000 of appellant's operating expenses representing a part of appellant's annual payments to American Telephone and Telegraph Company for license contract services, needed and used by, and of benefit to, appellant in the operation of its intrastate property. (Assignments of Error 4, 5 and 6.)

Refunds. (Argument pp. 63 to 74, *infra.*)

Under Ohio law, increases in rates not collected under bond are not refundable. The Commission determined the amount of the refunds, not with regard to the value of appellant's property or its net income referable to rates collected under bond, but by the use of accounting apportionments bearing no relation to such value or net income. As a result of such apportionments the Commission in effect required appellant to refund more than $4,000,000 of revenues not collected under bond.

Also, the Commission ordered toll revenues aggregating $409,127 to be refunded for the years 1925 and 1926, without any consideration or finding of the value of appellant's toll property or its toll revenues, expenses or net income and without any factual basis upon which such a refund could have been determined. (Assignments of Error 7 and 8.)

Valuation. (Argument pp. 74 to 86, *infra.*)

The Commission's final valuation of appellant's intrastate property was confiscatory in that:

(1) Seven parcels of useful real estate of the admitted value of more than $500,000 were excluded from the valuation as of June 30, 1925.

(2) No recognition was given to the element of going value. In the tentative finding the Commission found that appellant's property had a going value and made a separate allowance of approximately $3,500,000 therefor as of June 30, 1925. But in the finding of final value it wholly eliminated this allowance and made no other allowance therefor.

(3) Although finding Western Electric prices to appellant for telephone apparatus to have been reasonable during the period when such prices were decreasing, the Commission refused to give any weight to a proper increase therein effective November 1, 1930.

(4) Fair consideration was not given either to the reproduction cost new or the actual cost of the property. (Assignments of Error 11, 12 and 13.)

Overruling Appellant's Protests, Applications for Rehearing and Requests.

Appellant filed with the Commission its protests and applications for rehearing with respect to each of the orders of the Commission complained of. It likewise filed three requests for leave to examine and rebut the undisclosed information on which the Commission's price trend percentages for 1926 to 1933 were based. In each of these protests and applications for rehearing and requests, appellant pointed out specifically the foregoing errors committed by the Commission, asserted that the Commission's action had resulted in a denial of due process, and raised all of the same constitutional questions later presented to the Supreme Court of Ohio and now urged in this Court. (R. 253; 272; 277; 309; 313; 335; 370; 380; 383.) All such protests and applications for rehearing and requests were overruled by the Commission. (R. 274; 275; 372; 373; 719; 722; 724.) (Assignment of Error 15.)

SUMMARY OF ARGUMENT.

USE OF PRICE TRENDS.

Assignments of Error 1, 2, 3 and 13(b);
Argument pages 25 to 37.

In arriving at the value of appellant's intrastate property as of June 30, 1925, the Commission made a detailed appraisal by separate classes of property. In contrast, for the years 1926 to 1933 the Commission fixed the value of the property by applying a single, composite price trend percentage to the property value found for the preceding year, plus net additions, the percentage purporting to reflect the relation of values for the current year to the value for the preceding year.

The values so arrived at for each of the years 1926 to 1932 deprived appellant of its property without due process of law in violation of the Fourteenth Amendment because:

(a) The price trends were based on secret price information obtained from various sources, undisclosed to appellant and not offered or introduced in evidence;

(b) Appellant's written requests to examine and rebut this secret information were denied;

(c) The values were fixed not by the exercise of judgment but by an arbitrary formula which gave no weight to reproduction cost new.

Manifestly, the fixing of a value for each of the years was one of the necessary steps in the Commission's process of determining whether appellant had excess earnings for the year, a portion or all of which appellant could be required to refund. Having found the property value for each year, the Commission then determined the rate of return to which appellant was entitled upon the value thus found and whether its net income for the year as adjusted by the Commission exceeded its permissible earnings. By this method appellant was found to have had excess earn-

ings for each of the years 1925 to 1932, amounting in the aggregate to $13,289,172, of which the sum of $11,832,264 (arrived at by the apportionment method hereafter discussed) was ordered refunded for the years 1925 to 1932. Of the $11,832,264 thus ordered refunded, $10,462,787 represented refunds for the years 1926 to 1932, for which years the property values were determined by the application of the arbitrary formula based on price trend information withheld by the Commission.

DISALLOWANCE OF EXPENSES.

Assignments of Error 4, 5 and 6;
Argument pages 37 to 63.

In finding appellant's net income for each of the years 1925 to 1933 the Commission excluded from appellant's operating expenses large sums on account of (1) the annual expense of depreciation and (2) payments to American Telephone and Telegraph Company for license contract services.

The Commission's action in these respects was arbitrary, unsupported by the evidence and amounted to a denial of due process of law.

(1) Depreciation Expense.

The Commission purported to base its allowance for the annual expense of depreciation upon appellant's retirement experience, that is, the cost of plant retired. It used for that purpose appellant's retirement losses for the three years and nine months immediately preceding June 30, 1925, and wholly disregarded appellant's retirement losses experienced during the years 1925 to 1933, the period for which appellant's rates were under investigation. As the result, the Commission's allowance for the expense of depreciation for the years 1925 to 1933 was $8,067,266 less

than appellant's losses on account of intrastate plant retirements for that period.

The Commission's allowance for the expense of depreciation was also made in disregard of the evidence, which fully established the propriety of appellant's depreciation rates, based on the service life and salvage of its several classes of plant.

It was error to base the amount of appellant's annual depreciation expense upon its retirement experience but if that basis was to be adopted, there was no justification for requiring appellant to absorb without reimbursement more than $8,000,000 of retirement losses experienced during the period under investigation.

(2) License Contract Payments.

Of appellant's total payments to American Telephone and Telegraph Company for 1925 to 1932, inclusive, for license contract services, the Commission disallowed more than $2,800,000 referable to appellant's intrastate business. The disallowances were based upon the Commission's finding that a portion of the services rendered were either (a) of no benefit to appellant, or (b) incurred by the American Company, not in rendering license contract services, but for its own benefit as a holding company. The proof showed that the services were needed, used by, and of benefit to appellant, and that such payments did not exceed the cost to the American Company of rendering the services.

REFUNDS IMPROPERLY ORDERED.

Assignments of Error 7 and 8.—
Argument pages 63 to 74.

During the period covered by the Commission's refund order, increases in some of appellant's rates had been collected under bond, conditioned to repay the portion of the increases found to be excessive. Under Ohio law no refunds could be ordered except with respect to appellant's rates thus collected. Of the excess earnings of $13,289,172 found for the period (1925 to 1932), the Commission ordered refunds to the amount of $11,822,264. This amount was determined arbitrarily, not with regard to the value of appellant's property, or its net income referable to rates collected under bond, but by the use of an accounting apportionment bearing no relation to such value, or net income.

The apportionment undertook to arrive at the amounts of the refunds, first, by finding the percentage relation of the gross exchange revenues of the exchanges where one or more of the rates were increased under bond (even though in many instances only a few of the rates for such exchanges were bonded and subject to refund), to appellant's total gross exchange revenues from all exchanges for that year; and second, by applying the resulting percentage to the excess earnings from appellant's entire intrastate business found for such year, the resulting amount being ordered refunded. The Commission's method was erroneous not only in that it employed gross revenue as the basis for the apportionment, but also in that by counting or treating as bonded revenue all revenue of each exchange wherein any rate was increased under bond, the Commission required appellant to refund more than $4,000,000 of revenues not collected under bond.

Further, the Commission ordered a refund of toll revenues aggregating $409,127 for the years 1925 and 1926

without any consideration or finding of the value of appellant's toll property, its revenues, expenses or net income and without any factual basis upon which such a refund could have been determined.

The method used was purely arbitrary, was arbitrarily applied in disregard of the evidence and resulted in a denial of due process.

VALUATION.

Assignments of Error 11, 12 and 13;
Argument pages 74 to 86.

The Commission's valuation of appellant's intrastate property was confiscatory in the following particulars:

(1) Omitted Land.

On June 30, 1925, appellant owned seven parcels of real estate of an admitted value in excess of $500,000 purchased as sites for telephone exchange buildings. Although on some of the parcels telephone buildings were then under construction and although all of them had been purchased before, and were within a reasonable time after June 30, 1925, actually used in appellant's telephone business, the Commission excluded all of the parcels from the rate base as of that date.

As the result, the final findings of value for 1925, 1926, 1927, and 1928, which contained no allowance for these parcels of land, understated the value of appellant's property by the following amounts:

$586,959 for 1925
$550,962 for 1926
$ 95,241 for 1927
$ 53,646 for 1928

(2) Going Value.

In the finding of tentative value as of June 30, 1925, the Commission made a separate allowance of approximately $3,500,000 for the going value of appellant's property. In the finding of final value the Commission wholly eliminated this allowance and made no other allowance therefor. The existence of going value was established by competent evidence and admitted by the Commission. Failure to give recognition to it either as a separate item or otherwise resulted in a denial of due process.

(3) Western Electric Prices.

The Commission found that the prices charged appellant by Western Electric Company for telephone apparatus were reasonable except for a price increase of approximately 10% effective November 1, 1930. The evidence showed and the Commission found that the profits made by Western in its Bell business were reasonable. The price increase of November 1, 1930 was necessary because Western, after having reduced its prices steadily during the years in controversy, had made a further price reduction in 1929, based upon an expected increase in business which did not develop.

What weighting was given to Western's prices in the Commission's trended property values for the years 1926 to 1933 was not disclosed, but admittedly for those years the Commission gave some weight to decreases in Western's prices and none to the increase of November 1, 1930.

(4) Cost and Reproduction Cost.

The Commission in its valuation failed to give proper weight either to the reproduction cost new or to the actual cost of the property.

ARGUMENT.

I. PRICE TRENDS.

Assignments of Error 1, 2, 3 and 13(b).

The fixing of the value of appellant's intrastate property for each year was one of the necessary steps in the process adopted by the Commission for determining whether appellant had excess earnings for each year, a portion or all of which it could require appellant to refund.

The Commission first determined the value of appellant's property, the rate of return to which it was entitled, and whether its net income, as adjusted by the Commission, exceeded its permissible earnings. By this method it found that appellant had excess earnings for each of the years 1925 to 1932.

The Commission's valuation for 1925 was based upon a detailed inventory and appraisal. In contrast, for each subsequent year the Commission fixed the value of the property exclusively by the use of a composite price trend percentage developed by it and applied to the value found for the preceding year.

The refunds ordered for 1926 to 1932, inclusive, aggregating $10,462,787, with interest, were necessarily based upon the Commission's trended values of appellant's property for those years.

Price Trends Based on Information Withheld from Appellant.

The values so arrived at for 1926 to 1932, inclusive, deprived appellant of its property without due process of law in violation of the Fourteenth Amendment, because the price trends which the Commission applied in fixing such values and which were the basis of its refund order for those years were based on information withheld from appellant and not offered or introduced in evidence.

With respect to the sources of the information upon which its price trends were based the Commission in its findings of January 16, 1934 said:

(a) "A study was made of the cost prices furnished by manufacturers of telephone equipment over the several years";

(b) "The trend of land valuation was ascertained from examination of the tax value in communities where the company had its largest real estate holdings, confining such to urban property only";

(c) "For building trends resort was had to prices indices of the *Engineering News Record*, a recognized magazine in the field of engineering construction";

(d) "Labor trends were developed from the same sources";

(e) "Resort was also had to the finding of the Statutory Court in the Chicago case and its study of price level of sales of the Western Electric Company." • (R. 188.)

Appellant first learned of the Commission's use of price trends in fixing values for the years 1926 and thereafter when the order of January 16, 1934 was announced. (R. 187.) On February 6, 1934 appellant filed its protest and application for a rehearing in which it complained of the Commission's use of the trends and on February 17, 1934 its written request for an opportunity to examine and rebut the information upon which they were based. (R. 256; 273.) This request was followed by two similar ones. (R. 312; 383.) The protest and all three requests were summarily overruled. (R. 274; 275; 373; 722.)

• Appellant was familiar with the findings of the statutory court in respect of Western Electric Company prices for telephone apparatus, but it had no opportunity to ascertain what weighting was given to this information or how the prices were applied by the Commission.

The protest and requests challenged, as a denial of due process, the action of the Commission in withholding from appellant the information on which the price trends were based. At every other appropriate stage of the proceedings, both before the Commission and in the Supreme Court of Ohio, appellant challenged this withholding of information and asserted its constitutional rights in respect thereof, all to no avail. (R. 278-80, 303; 321-2, 324; 336-8, 369-70; 387-9, 431; 94-6, 115; 441-3, 480; 487-9, 499; 506-8, 531; 592-5.)

Thus appellant has been denied all information with respect to:

(a) the names of the manufacturers of the telephone equipment referred to in the findings, the prices furnished by them, the years to which the prices applied, and the nature of the equipment for which the prices were furnished;

(b) what land values were used by the Commission, for what years, and in what cities of Ohio;

(c) what trends were taken from the *Engineering News Record*, and to what character of building, material and labor costs they applied; and

(d) how the trends were compiled and the prices, costs, values and other information weighted.

The only other part of the record which sheds light on the character of the information is the following statement from the dissenting opinion of the chairman of the Commission, accompanying the findings and order of January 16, 1934:

> "These cost trends applied in the majority findings do not reflect telephone construction costs. They were derived from trade magazines and other publications not in evidence, and as to which the telephone company has had no opportunity to be heard." (R. 224.)

This the majority has never denied in any subsequent finding or order.

The record does not otherwise disclose the sources of or any details concerning this price trend information, how it was compiled, or what weight the Commission gave it in fixing the value of appellant's property for the years in question.

Denial of Due Process.

The use of such information in fixing the value of appellant's property for all years subsequent to 1925 was a denial of due process. In effect, there has been no trial.

Interstate Commerce Commission v. Louisville & Nashville Railroad Co., 227 U. S. 88, 57 L. ed. 431;

West Ohio Gas Co. v. Public Utilities Commission of Ohio (No. 1) 294 U. S. 63, 79 L. ed. 761;

West v. Chesapeake & Potomac Telephone Co., 295 U. S. 662, 79 L. ed. 1640.

In *Interstate Commerce Commission v. Louisville & Nashville Railroad Co., supra,* this Court in holding that an order of a regulatory body must rest on evidence, said (p. 91):

> "if the Government's contention is correct, it would mean that the Commission had a power possessed by no other officer, administrative body, or tribunal under our Government. It would mean that where rights depended upon facts, the Commission could disregard all rules of evidence, and capriciously make findings by administrative fiat. Such authority, however beneficently exercised in one case, could be injuriously exerted in another; is inconsistent with rational justice, and comes under the Constitution's condemnation of all arbitrary exercise of power. • • •

"All parties must be fully apprised of the evidence submitted or to be considered, and must be given opportunity to cross-examine witnesses, to inspect documents and to offer evidence in explanation or rebuttal. In no other way can a party maintain its rights or make its defense. In no other way can it test the sufficiency of the facts to support the finding; for otherwise, even though it appeared that the order was without evidence, the manifest deficiency could always be explained on the theory that the Commission had before it extraneous, unknown but presumptively sufficient information to support the finding."

In *West Ohio Gas Co. v. Public Utilities Commission of Ohio, supra,* this Court, commenting upon the Ohio Commission's *ex parte* use of the annual reports of the utility whose rates were under investigation, said (p. 69):

"A hearing is not judicial, at least in any adequate sense, unless the evidence can be known. • • •

"But the weakness of the case for the appellee is that the fundamentals of a fair hearing were not conceded to the company. Opportunity did not exist to supplement or explain the annual reports as to the distribution of the expenses in the neighboring communities, nor did opportunity exist to bring the rates outside of Lima into harmony with the exigencies of a new method of allocation adopted without warning."

In the present case the undisclosed information was not from appellant's records. It was compiled, weighted and applied in a way wholly unknown to appellant. It came from sources not sufficiently identified to furnish more than meagre information as to its general, and none as to its specific, character.

The trended value for 1926 and each of the subsequent years was one of the necessary factors in the Commission's determination that appellant was liable to refund $10,462,787 for those years. Appellant has been ordered to re-

pay this sum without any hearing, because the evidence upon which the value of its property was fixed has been withheld from it.

Appellant's Evidence Rejected.

As shown at page 3, *supra*, appellant's rates during the period of the Commission's investigation were of two kinds: (a) those in effect pursuant to the Pence law, under bond limited to the repayment of "such portion of such increased rate" as the Commission might determine to be unreasonable or excessive, and (b) those in effect without bond.

Under the Ohio law refunds could not be ordered with respect to rates not collected under bond:

> *City of Lima v. Public Utilities Commission*, 106 Ohio St. 379, 386, 140 N. E. 147, 149 (1922);
>
> *Great Miami Valley Taxpayers Assn. v. Public Utilities Commission*, 131 Ohio St. 285, 2 N. E. (2d) 777 (June, 1936).

This principle was recognized in the present case by the Commission in its findings and by the Ohio Supreme Court in its decision. (R. 304; 372; 3738-57; 3797-3800; 244; 276; 8193-8212; 534.)

Appellant repeatedly offered to prove that the Pence Law rates made effective under bond were reasonable, by showing the fair value of its property and its net income in the affected exchanges and the toll system. (See page 12, *supra*.)

Indeed the Commission itself concedes that appellant insisted, throughout the progress of the proceeding, upon its right to make such proof, saying, in its findings of January 16, 1934:

> "With the institution of the company-wide case, the Commission as then constituted determined not

to proceed at that time with the separate Robinson Law and Pence Law cases, and the Commission's inquiry has ever since proceeded on the company-wide basis, without separate testimony as to the property value, rates, etc., for the Robinson and Pence Law cases. This course originally had and apparently ever since has had the approval of the City Attorneys interested in those cases, although the Telephone Company has always insisted upon the right to present, and has offered to present, separate testimony with respect to them." (R. 190.)

Decision of Supreme Court of Ohio.

That the price-trends used by the Commission were based on information withheld from appellant and to which it was denied access is not disputed. The Supreme Court of Ohio, admitting this, sought to justify the Commission's action solely on the ground that this Court has decided that judicial notice may be taken of the existence of a depression and of the fact that there have been profound changes in value during the progress of a hearing.

In that connection the Supreme Court of Ohio said:

"Likewise the company strenuously complains because, although neither side introduced evidence of price trends, the commission took judicial notice of such trends; but even a casual examination of the decisions of the United States Supreme Court unquestionably discloses definite and repeated sanction of this principle." (R. 570.)

and cited:

Central Kentucky Natural Gas Co. v. Railroad Commission of Kentucky, 290 U. S. 264, 78 L. ed. 307;

Dayton Power & Light Co. v. Public Utilities Commission of Ohio, 292 U. S. 290, 78 L. ed. 1267;

Atchison, Topeka & Santa Fe Railway Co. v. United States, 284 U. S. 248, 76 L. ed. 273.

Although these cases are authority for the proposition that judicial notice will be taken of the fact that there have been profound changes in price levels and economic conditions, they are not authority for the valuation of property by a regulatory body by the use of secret information.

To sustain the Commission's orders, it was necessary for the Ohio court to hold that judicial notice may be taken not only of the existence of a depression, with consequent marked declines in property values, but also of the extent of the declines, and that, having done so, the Commission may then withhold from the utility such information as was used.

If the ruling of the Supreme Court of Ohio in the present case be correct, values for utility property may lawfully be fixed *in camera*. Hearings in such cases would become an idle ceremony. The Commission would be authorized to notice judicially the extent to which changes in economic conditions had affected utility property and to fix values accordingly.

For such action no decision of this Court, either in letter or spirit, affords the slightest justification. The exercise of such arbitrary power is inconsistent with every concept of a fair hearing.

Use and Effect of Valuation Formula.

In order to obtain the value of appellant's property for 1926, the Commission applied a price trend percentage to the value found by it for 1925. The trend percentage for 1926 was 98.73 of the 1925 value. The value for each succeeding year was fixed by an identical process. The trend percentages for the other years are set out at page 8 *supra*.

That the Commission converted the value for each year into a value for the next succeeding year solely by the use of a trend percentage which, when ascertained, was applied without modification, appears from the following statement in its findings:

> "The composite percentages shown on Line 2 were developed by the Commission's Engineers and represent the relation of values for each current period to the preceding period and they have been applied to the basic figures bearing corresponding alphabetical designations."* (R. 232.)

Thus it appears that by the use of the price trends the Commission abandoned the exercise of judgment in fixing value, gave no weight to reproduction cost, and gave full weight to every fluctuation in value found by it to have occurred between 1926 and 1933. That this is true appears from the following portion of the Commission's graph (R. 245) which shows the trends developed and applied by it in fixing the value of appellant's property for each year subsequent to 1925:

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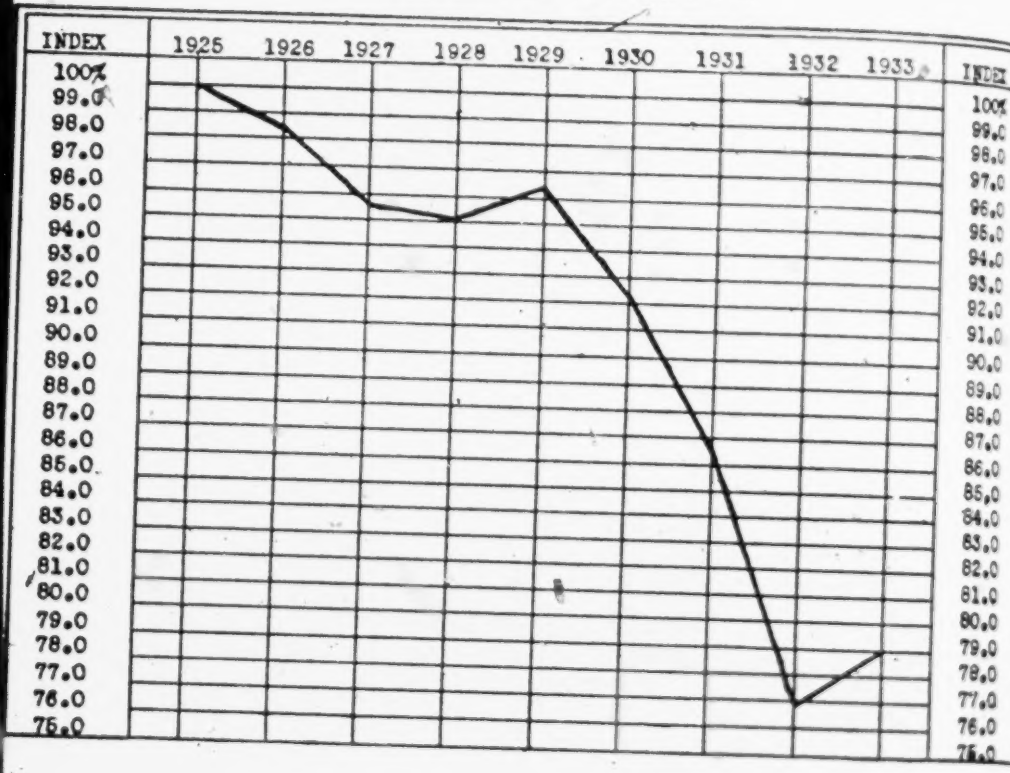
* This quotation appears in the table showing the Commission's application of price trends, Appendix B to the Commission's finding of January 16, 1934, Appendix hereto, p. ix. The basic figures referred to are the values for each preceding year.

COMMISSION'S PRICE TRENDS.



The Commission's use of these price trends, whereby it precluded the exercise of judgment as to value and gave full weight to every price fluctuation found by it to have occurred during the period, resulted in the denial of due process.

West v. Chesapeake & Potomac Telephone Co., 295 U. S. 662, 79 L. ed. 1640.

In that case, this Court, in condemning the use of a price trend formula in fixing values, said (p. 671):

> "To an extent value must be a matter of sound judgment, involving fact data. To substitute for such factors as historical cost and cost of reproduction, a 'translator' of dollar value obtained by the use of price trend indices, serves only to confuse the problem and to increase its difficulty, and may well lead to results anything but accurate and fair. This is not to suggest that price trends are to be disregarded; quite the contrary is true. And evidence of such trends is to be considered with all other relevant factors."

In the same case this Court held that although the owner of utility property is entitled to the benefit of an enhancement in value when a permanently higher price level has been reached and must suffer the loss incident to a permanently lower price level, the character of utility property is such that its fair value does not shift with each temporary price change. The Court said (p. 672):

> "But it is to be remembered that such a property as that here under consideration is a great integrated aggregate of many and diverse elements; is not primarily intended for sale in the market, but for devotion to the public use now and for the indefinite future; and has, so far as its market value is concerned, no real resemblance to a bushel of wheat or a ton of iron. While, therefore, the owner of such a property must assume and may not pass on to the public the risk involved in a general decline in values, and may

have the advantage also of a general rise in such values, it would not only be unfair but impracticable to adjust the value and the consequent rate of return to sudden fluctuations in the price level. For in its essence this is the sort of aggregate whose value is not fairly or accurately reflected by such abrupt alterations in the market. A public service corporation ought not, therefore, in a rate proceeding, to be permitted to claim to the last dollar an increased value consequent upon a sudden and precipitate rise in spot prices of material or labor. No more ought the value attributable to its property to be depressed by a similar sudden decline in the price level."

Here, by the use of price trends, the Commission decreased the value of appellant's property between December 31, 1929 and December 31, 1932, from 96.3% of the 1925 base to 76.8% of that base. The effect of the trending was that at the end of the period (1933), the Commission's finding of value was $35,000,000 less than appellant's investment in plant. (R. 232; 8414.)

That the Commission did give full weight, and admittedly so, to each year's fluctuation in the price level is graphically illustrated by the price trend percentages shown in the chart *supra* at page 34, and by the Commission's statement that those percentages "represent the relation of values for each current period to the preceding period." (Finding of January 16, 1934, R. 232; Appendix hereto, page ix.) That the fluctuations reflected by the Commission's price trends were abnormal is illustrated by the almost precipitous decline beginning with 1929, the first year of the depression, and ending with the year 1932, the Commission's level for the latter year being 20% below the 1929 level and 23% below the 1925 level. Not only that, but the chart shows that by 1933 prices were again sharply in the ascendance, clearly demonstrating that none of the decline between 1929 and 1932 reflected a new permanently

low level of prices. As already stated, appellant does not know what prices or other factors the Commission used in formulating its trends, how they were weighted or how applied. With respect to the results of their application, however, the Commission's chart tells its own story. Trended values, arrived at no one knows how, but reflecting on their face sudden, even violent, fluctuations in price levels are unfair in themselves, quite apart from the method employed in arriving at them.

II. DISALLOWANCE OF EXPENSES.

Assignments of Error 4, 5, and 6.

The Commission overstated appellant's net income by excluding large sums from its operating expenses for each of the years 1925 to 1933 on account of (1) the annual expense of depreciation and (2) payments to American Telephone and Telegraph Company for license contract services.

(1) Annual Expense of Depreciation.

The Commission purported to base its allowance of 4% for the annual expense of depreciation upon appellant's retirement experience, that is, the loss resulting to appellant from the retirement of plant. (R. 200-3.) But for this purpose it used solely appellant's retirement losses from September 21, 1921 to June 30, 1925, a period of three years and nine months immediately preceding the date certain. (R. 201-3.) It completely disregarded appellant's proven retirement losses for the years 1925 to 1933, the exact period for which the allowance for the annual expense of depreciation was fixed and allowed for that expense $8,067,266 less than the actual cost of such retirements. (See table, page 40, *infra.*)

Depreciation Rate Calculated on Undepreciated Base But Applied to Depreciated Base.

Before discussing the effect of the Commission's allowance, attention is called to the wholly inconsistent method by which the 4% composite rate was calculated and applied.

After finding that appellant's retirement losses during the earlier period (1921-1925) had averaged annually 3.74% of the undepreciated cost of appellant's property, the Commission stated that it had allowed a composite rate of 4% for the annual expense of depreciation during the period under investigation. (R. 203.) In reality its allowance for 1925 was only 3.45% of the undepreciated reproduction cost.

Since 3.74% was the ratio of actual retirement losses to *undepreciated* cost, if the allowance for the period under investigation was to be even the equivalent of appellant's retirement losses during the earlier period, the Commission was bound to apply the 3.74% to an *undepreciated* base, i.e., to the *undepreciated* reproduction cost of appellant's property. If the allowance was to be the rounded figure of 4%, it was similarly bound to apply the 4% to an *undepreciated* base.

Instead, the Commission applied its 4% depreciation rate to the reproduction cost new *depreciated*, which for the year 1925 was the equivalent of only 3.45% of the *undepreciated* reproduction cost. (R. 203; 204.) For that year, the reproduction cost new of the intrastate depreciable property, as fixed by the Commission, was $94,964,521. (R. 231; 234; 242.) The reproduction cost new, less depreciation, as fixed by the Commission, was $81,956,540. The Commission's allowance for the annual expense of depreciation for that year was $3,279,417. (R. 236.) This allowance was 4% on a depreciated base but only 3.45% on an undepreciated base.

Had the Commission applied the 3.74% (the ratio of retirement losses to book cost 1921-1925) to its value of appellant's depreciable property (undepreciated) for the years 1925 to 1932, its allowance for the annual expense of depreciation would have been $1,404,668 greater than it was. Had it applied the 4% to such value during the same period, its allowance for this expense would have been $4,117,484 greater than it was. (Computed from appendices A, F, L and K to Findings of January 16, 1934, R. 231; 236; 242; 243.)

While clearly an annual rate of depreciation should be applied to an undepreciated, not a depreciated base, that is not the point made here. The point is that the Commission having related the retirement losses for 1921 to 1925 to the undepreciated cost of the depreciable property for that period and thus arrived at a ratio for computing that expense, was bound to apply that ratio to the same sort of a base in the period for which the depreciation rates were fixed.

The Commission had no right to determine appellant's expense of depreciation for the period under investigation by its retirement losses, and particularly not by the retirement losses of an earlier period. But certainly if this method was to be adopted the Commission should at least have calculated this expense fairly.

Depreciation Allowance $8,067,266 Less Than Actual Retirement Cost.

But however the expense of depreciation was calculated, the inescapable fact is that the Commission's allowance for the expense of depreciation for the years 1925 to 1933, inclusive, was $8,067,266 less than the actual cost to appellant of its intrastate plant retirements during that period as shown by the following table:

COMPARISON OF INTRASTATE RETIREMENT COST WITH DEPRECIATION ALLOWANCE.

Year	(1) Retirement Cost	(2) Commission's Depreciation Allowance	(3) Retirement Cost Exceeds Depreciation Allowance (1—2)
1925	$4,087,957	$3,279,417	$ 808,540
1926	6,147,042	3,615,622	2,531,420
1927	5,480,935	4,057,929	1,423,006
1928	6,087,763	4,549,602	1,538,161
1929	5,286,358	4,963,810	322,548
1930	6,863,374	5,488,561	1,374,813
1931*	7,295,279	5,805,198	1,490,081
1932†	4,732,839	5,858,001	‡1,125,162
1933†	5,507,983	5,804,124	‡ 296,141
Total	$51,489,530	$43,422,264	$8,067,266

In the case of a rapidly growing telephone property, such as appellant's, the retirements at one point of time relate to the older and smaller plant, and therefore, the depreciation allowance for such a property should be in excess of a sum merely sufficient to meet current retirement losses. (*Cf. Lindheimer v. Illinois Bell Telephone Co.*, 292 U. S. 151, at p. 171, 78 L. ed. 1182.) It was therefore error for the Commission to have based the allowance for the annual depreciation expense wholly upon appellant's retirement experience, but if that basis was to be adopted, certainly there was no justification for requiring appellant to absorb without reimbursement $8,067,266 of

‡ Indicates red figures.

* Compiled, for 1925 to 1931, from Wood Ex. 12, R. 8182 B, and Finding of Jan. 16, 1934, Appendices F and L, R. 236; 243.

† Based on Monthly Report No. 6 for Month of November, 1933, R. 8424, and Finding of Jan. 16, 1934, Appendices F and L, R. 236; 243.

retirement losses during the exact period for which its rates were under investigation. This is precisely what the Commission's orders accomplish.

In speaking of an analogous situation this Court in *West Ohio Gas Co. v. Public Utilities Commission of Ohio* (No. 2) 294 U. S. 79, 79 L. ed. 773 said (p. 81):

> "The earnings of the later years were exhibited in the record and told their own tale as to the possibilities of profit. To shut one's eyes to them altogether, to exclude them from the reckoning, is as much arbitrary action as to build a schedule upon guesswork with evidence available."

Appellant's Annual Depreciation Rates Rejected.

In determining annual rates of depreciation the factors to be considered are service life and net salvage. (R. 1391; 1392; 3212; 6946, 7021-2.) Appellant's annual rates for each of its several classes of plant were based on these factors and the propriety of its rates established by its engineers, familiar with the telephone business in general and with the particular plant under consideration. (R. 1390-1405; 3212-4; 3216-23; 3640-73; Schneider Exs. 4 to 13 inclusive, and Schneider Ex. 21; R. 7229-39; 7241.) These rates were not criticized by Hagenah, the Commission's witness, although he had been asked by the Commission "to report to the Commission the proper depreciation requirement" for appellant, (R. 1984; 2132) and throughout the entire investigation the rates were challenged by no one. The Commission's action in rejecting them was arbitrary.

The Commission rejected appellant's depreciation evidence and in effect adopted the retirement method, although its allowance for the expense was less than appel-

lant's retirement losses experienced during the period in controversy.*

The retirement method of determining the expense of depreciation results in postponing charges for loss currently sustained on account of depreciation until such losses are fully realized and the depreciated plant removed from service. Under this method the utility is not expected to and will not receive reimbursement for the loss of its property until actual removal.

Depreciation accounting, on the contrary, contemplates that losses due to the depreciation in the value of plant are to be charged to operating expenses in equal monthly installments for the period of the service life of the property and that thereby the utility will receive compensation for such loss as it is being occasioned, without respect to whether the plant is then removed from service. (R. 6946, 7021-2; 3220.)

When depreciation accounting is adopted, it is fair that the utility shall earn on the present, i.e., the depreciated, value, because it is currently receiving compensation for loss in respect of plant whose service life is being exhausted but which has not yet been retired from service.

On the contrary, if retirement accounting be adopted no substantial reserve is contemplated and none will in fact be created. For example, in this case, if appellant's reserve for depreciation be recomputed in accordance with the Commission's annual depreciation allowance, its reserve which was $12,156,070 in 1925 would have been reduced to $3,908,911 in 1933. The table showing these amounts appears on page 15 *supra*.

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* Retirement accounting was condemned as unsound by the Interstate Commerce Commission in Docket 14700, "Depreciation Charges of Telephone Companies," 177 I. C. C. 351 at pages 394-5 and so far as appellant knows has never been approved by any court.

Under the retirement method appellant will be reimbursed for loss only when fully realized. In the meantime, if permitted to earn on a depreciated base only, it will have in service at all times property for which it is receiving neither a current return, nor reimbursement for progressive depreciation.

In this case the Commission, in arriving at the rate base as of June 30, 1925, deducted from the value of appellant's property the sum of $14,226,709 on account of existing depreciation and in addition, as we have heretofore shown, limited appellant's depreciation expense to an amount which was less by $8,067,266 than the actual cost of its plant retirements during the period under investigation.

The Commission was right in deducting existing depreciation in arriving at the value of appellant's property. It was wrong in determining the annual expense of depreciation by a method which denied appellant an opportunity to create a reserve for depreciation.

Attempted Justification of Commission's Depreciation Rates.

It is attempted to justify the Commission's allowance for the annual expense of depreciation on the grounds (a) that appellant's retirement experience during the period under investigation, 1925 to 1933, was abnormal, (b) that the Commission gave actual consideration to appellant's retirement experience during these years, (c) that appellant's annual rates of depreciation were fixed at excessive amounts in order to build up reserves for depreciation insufficient at the date of appellant's organization, and (d) that appellant's voluntary reduction in its rates of depreciation for 1932 and 1933 was an admission that its rates prior thereto were excessive.

The record does not sustain any of these claims.

(a) Appellant's retirement losses during the period under investigation were not abnormal. The accounts showing such losses were examined by the Commission's accountant. (R. 3634-5; Wood Ex. 12, R. 8182 B.) They were not challenged as unnecessary in any respect by him (R. 3634-5), by any other witness, or in the Commission's findings.

The claim of "abnormal" retirement losses rests solely upon the assertion that some of appellant's properties acquired from predecessor companies included duplicate, non-useful plant facilities the subsequent removal of which resulted in abnormal plant retirements.

Appellant was organized in 1921 by the consolidation of the Ohio State Telephone Company and the former Ohio Bell Telephone Company. Pursuant to a wide-spread public demand, the competing service furnished by these companies in certain cities in Ohio was eliminated by physical unification of the plants. The unification had been practically completed prior to the date certain (Eide Ex. 1, R. 6492 B.)

In 1926 Hagenah, the Commission's witness, investigated the situation and testified that while there was some duplicate property if by that term was meant "parallel construction," there was no non-useful plant.

In this connection he said:

> "This property to which you have now directed my attention (telephone buildings), as well as the parallel poles, wires and cable construction, was all used and useful on the inventory date with no more excess capacity than is usually regarded as proper for spare facilities." (R. 2098.)

This evidence was never disputed. The Commission decided, as it was bound to do, that appellant had no unnecessary plant margin. It made no deduction from ap-

pellant's property on account of non-useful plant. On the contrary, the Commission found that appellant's entire plant was used and useful on the date certain, saying in its tentative findings:

> "The inventory submitted by the company's witness, Williams, is complete and amazingly detailed. A complete check was made by State's witness, Hagenah, and other State's witnesses of the inventory and after that check the company's inventory was acceptable to all of the State's engineers and is therefore accepted by this Commission as the basis for valuation." (R. 128.)

This finding was never modified. There having been no non-useful plant upon which to predicate the claim of abnormal retirements, the claim falls of its own weight. Likewise the statement of the Supreme Court of Ohio (R. 578) that the Commission disregarded appellant's retirement experience during the period under investigation because the Commission found it to be abnormal, is without basis, because the Commission did not so find. The "abnormal" retirement theory was an afterthought of Commission's counsel. There was no evidence to sustain it, no finding of the Commission upon which it could rest.

The period of the Commission's investigation was one of great industrial and commercial expansion. In the years from 1925 to 1930 the number of appellant's telephones increased by more than 40% requiring an additional investment in plant of almost $65,000,000. (R. 191; 8361.)

To meet this unprecedented growth, large quantities of all classes of plant had to be retired because of inadequacy. The Commission simply refused to permit appellant to reimburse itself for the inevitable losses so occurring.

The physical unification of competing telephone properties was in the public interest. It was made with the

Commission's express approval. Even had there been a small amount of non-useful parallel plant, a condition which the evidence refutes, the Commission would not have been justified in refusing to provide reimbursement to appellant for its retirement.

Pacific Telephone & Telegraph Co. v. Whitcomb, 12 F. (2d) 279, 288;

Michigan Public Utilities Commission v. Michigan State Telephone Co., 228 Mich. 658, 200 N. W. 749;

Re Lincoln Telephone & Telegraph Co. (Nebraska Commission), P. U. R. 1930 E 210.

(b) The claim that in arriving at its allowance for the expense of depreciation the Commission gave consideration to appellant's retirement losses during the period following 1925 is wholly without foundation in view of the Commission's allowance which was $8,067,266 less than appellant's retirement losses during the years 1925 to 1933. (See table page 40, *supra.*) It is self-evident that if such losses were considered, it was only for the purpose of rejecting them.

(c) The argument that appellant fixed its rates of depreciation at excessive amounts, because at the time of its formation in 1921 appellant took over other companies whose reserves were insufficient, and by excessive depreciation rates attempted to build up such reserves, is also without merit. Appellant's reserve for accrued depreciation applicable to its intrastate property for the year 1925 was 13.87% of the cost of its depreciable property and $2,000,000 less than the depreciation existing in that property, as found by the Commission. Under such circumstances the question whether appellant's reserves in 1921 were adequate or whether its annual depreciation rates from 1921 to 1925 were proper can have no bearing upon the deter-

mination of its reasonable depreciation rates from 1925 to 1933. There was no evidence even tending to show that the rates during the years in controversy were excessive. Any inference to that effect could be drawn if, and only if, under appellant's depreciation rates during such years the accretions to the reserve were excessive. The Commission did not so much as suggest that they were. The following history of appellant's reserve accumulated under its depreciation rates shows the fallacy of such a claim:

Appellant's reserve for depreciation resulting from the application of its own rates was, in 1925, 13.87% of the cost of its intrastate depreciable property. The reserve for depreciation for the subsequent years accumulated by the application of appellant's annual rates was: 1926, 12.70%; 1927, 11.00%; 1928, 10.37%; 1929, 10.86%; 1930, 11.22%; 1931, 11.61%; 1932, 12.81%; 1933, 13.93%.* (See table page 15, *supra.*)

The argument that appellant's depreciation rates were fixed at excessive amounts in order to increase a reserve claimed to have been originally inadequate is thus demonstrated to be untrue, because the ratio of reserve to depreciable property at the end of the period under investigation was almost identical with that at the beginning of the period.

If one test of the adequacy of appellant's depreciation rates is their effect on the depreciation reserve, then, by a parity of reasoning, a similar test may fairly be applied to the Commission's allowance. By recalculating the reserve for depreciation *at the Commission's allowance,* the reserve of $12,156,070, or 13.87% of the depreciable property, existing in 1925 would in 1933 have been reduced to $3,908,911, or 2.64% of such property. (See table, page 15,

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* With the growth of plant there was, of course, an increase in the dollar amount of the reserve. But the significant figure is the percentage relation.

supra.) There could be no clearer demonstration of the inadequacy of the Commission's rates.

(d) An inference that appellant's rates of depreciation were excessive prior to 1932 is attempted to be drawn from the fact that in that year appellant voluntarily reduced its annual rates. The resulting composite percentage became 4.4% instead of 5.8%. (Wood Ex. 16, R. 8190 B.)

This reduction was made because the substantial loss of telephones experienced in 1931 had demonstrated that for the first time the growth of appellant's plant had been temporarily arrested. (R. 3640-2.)

Inadequacy is one of the important factors in bringing plant to the end of its useful life. (R. 1391-2; 3641-2; 3656-8; 3666.) At the time of the reduction it had become apparent that retirements due to inadequacy were entitled to less consideration than theretofore. (*cf.* table, page 40.) That this was the reason for the reduction is shown by the evidence. (R. 3640-2.) There was no evidence to the contrary. When appellant's plant was growing rapidly, substantial recognition was necessarily accorded the factor of inadequacy in fixing depreciation rates. When growth was arrested and the factor of inadequacy reduced, depreciation rates were reduced.

Forecast Used When Proof Available.

The Commission's allowance for depreciation upon the basis of appellant's retirement losses for 1921 to 1925 cannot be justified on the ground that necessity existed for a forecast of appellant's probable retirement experience in the future. The Commission fixed the allowance in 1934, when appellant's retirement experience for the entire period 1925 to 1933 was known and in evidence. Prophecy cannot be resorted to when proof is available.

West Ohio Gas Co. v. Public Utilities Commission of Ohio (No. 2), 294 U. S. 79, 82, 79 L. ed. 773.

Current Maintenance Expense.

The Commission allowed appellant's charges to expense for current maintenance in full. It is stated in the Commission's finding and in the opinion of the Supreme Court of Ohio that the Commission's action in this respect was liberal. (R. 199; 579.)

The maintenance expenses of a telephone company such as appellant are wholly different from those of an ordinary industrial enterprise. They include the cost of repairs to aerial and underground plant, central office equipment, and station equipment, and station removals and changes, none of which are provided for in the depreciation rates, and which are necessary to keep that property in a condition for continued efficient use. (R. 6946, 7018, 7023-7.) Most of the money expended for such current maintenance is for labor, with but small amounts for material. That the ordinary repairs to appellant's plant were necessarily substantial is understandable when the character and extent of that plant is considered. On June 30, 1925 appellant had more than 150 exchanges, 500,000 telephones, 650,000 poles, 150,000 miles of open aerial wire and 5,000 miles of underground and aerial cable. (Williams Exs. 7A and 7B, R. 7467-7748; 191; 7865.) Between 1925 and 1930 appellant's telephones had increased by more than 40%, the added net investment amounting to $65,000,000, with a resulting increase in all classes of plant and in the related current maintenance expense. (R. 191; 8361.)

The evidence is uncontradicted that all sums included in appellant's current maintenance account were spent for current maintenance and nothing else. (R. 3186-7.) Appellant's expenditures were recorded in accordance with the Interstate Commerce Commission's system of accounts. (R. 3635.) The Ohio Commission's accountant examined appellant's accounts, had access to the underlying data, and found nothing to criticize in any of them. (R. 3634-5;

Wood Ex. 12, R. 8182 B.) There was neither proof nor permissible inference that the current maintenance account had been availed of for the purpose of making capital additions.

In the hearings before the Commission there was no challenge to the necessity for or propriety of appellant's expenditures for current maintenance. That body accepted appellant's proof. Under such circumstances this Court has held that the correctness of such expenditures is not open to attack in a subsequent judicial proceeding.

West Ohio Gas Co. v. Public Utilities Commission of Ohio, (No. 1) 294 U. S. 63, 73, 79 L. ed. 761.

Apart from every other consideration, the fact remains that the Commission wholly disregarded appellant's proven depreciation experience and allowed for its expense of depreciation $8,067,266 less than appellant's retirement losses during the exact period for which the expense of depreciation was fixed.

(2) License Contract Costs.

American Telephone and Telegraph Company furnished to appellant and other Bell Associate Companies license contract services for which appellant currently paid a stated per cent of its gross revenues for services performed for it.

Prior to 1926 the percentage payment was 4½. After successive reductions the payment was fixed on January 1, 1929, at 1½%, where it has since remained. (R. 204.)

The services consisted of advice and assistance in engineering, plant, traffic, operating, commercial, accounting, patent, legal, financial, administrative and other matters relating to the economical conduct of appellant's business, the right to use all American Company patents, free from

liability for infringement, and the right to use all new apparatus and methods developed through the research and experimental work of the American Company. (R. 206-7.) Until 1928 the services included the furnishing to appellant of all receivers, transmitters and induction coils required in its business. (R. 204; 238; 3368.) The services were of a character not performed by appellant within its own organization and the expense incident to the services was not duplicated in whole or in part in any other expense account. (R. 5508-10; 5784-5.)

Of the total amount paid by appellant to the American Company for license contract services used in its intrastate business, the Commission disallowed for the years 1925 to 1932, inclusive, more than $2,800,000. Details of the costs and disallowances are shown in Appendices G, H, I, and J to the Commission's order of January 16, 1934, Appendix hereto, p. xi *et seq.* (R. 238-41.)

Before the decision in *Smith v. Illinois Bell Telephone Co.*, 282 U. S. 133, 75 L. ed. 255, appellant had offered substantial proof with respect to the license contract services. Following that decision the Commission received additional evidence on the subject, including all of the license contract evidence before the Statutory Court in *Illinois Bell Telephone Co. v. Gilbert*, 3 F. Supp. 595. (R. 724.)

The proof showed:

First. That the license contract services were needed and used by appellant, and valuable to it in the operation of its telephone plant. (R. 1540-1621; 1652-71; 5446-75; 5497-5501; 5508-87; 6122-6219; Kositzky Exs. A-1, A-20, A-21, A-31, R. 6869-6910; Kositzky Exs. 2, 13, 26, 28, R. 9345-9568.)

Second. That appellant's payments therefor during the period did not exceed the actual cost to the American Company of furnishing the services. (Ex. A-201-B, R. 8843; 236-41.) This cost was proved in

two steps: (a) there was shown the total annual cost to the American Company of each of its twelve departments engaged in furnishing some part of the services, and (b) there was eliminated from such total cost that part representing non-license contract services. (R. 3330-92; Heiss Exs. 10 to 19 inclusive, R. 6804 A-13; Heiss responses 1 to 4 inclusive, R. 8250-86; Ex. A-103, R. 8772; Exs. A-115, A-116, R. 8777-9; Exs. A-198, A-199, R. 8840-1.)

Third. That the allocation to appellant's intrastate business of its proportion of such cost was proper. (Heiss Exs. 22-27, R. 6815-7; Exs. A-108-B, R. 8773; Exs. A-112-B, A-113-B, R. 8776 A-B; Exs. A-117-B to A-119-B inclusive, R. 8781-97; Exs. A-124-B to A-161-B inclusive, R. 8801-17; Exs. A-167-B to A-170-B, R. 8826-35; Exs. A-200-B, A-201-B, R. 8842-3.)

Fourth. That the services were worth more than appellant's payments therefor. (R. 1452; 1548; 1559; 1590-3; 1610-21; 1665-71; 5462-7; 6030-44; Kositzky Exs. A-32 to A-35 inclusive, R. 6911-4; Kositzky Exs. 30 to 33 inclusive, R. 9569-72; Anthony Ex. A-4, R. 6312; Uprichard Exs. 13 to 16 inclusive, R. 7407-9; 1435.)

The Commission disallowed portions of appellant's payments, because it found, first, that a part of the services had not resulted to appellant's benefit and, second, that a part of the services were for the exclusive benefit of the American Company as a holding company. (R. 211; 210-19.)

There are twelve departments of the American Company rendering license contract services. The Commission considered the costs incurred by each of these departments as well as certain non-departmental costs. It allowed appellant's allocable share of the costs of some of these de-

partments in full, others in part, and still others it disallowed entirely.

The principal items disallowed are:

Department of Development and Research.

The Department of Development and Research is engaged in fundamental research work in the field of electrical communication. Every activity of that department has direct relation to the improvement and development of the business in which appellant has invested more than $162,000,000.

The principal purpose of the research work of the department, as stated by Dr. Jewett, its head, is:

> "to advance, improve and cheapen the cost of giving telephone service through the application of scientific knowledge to the betterment of the equipment and methods which we have available for giving that kind of service." (R. 4092.)

Notwithstanding the direct relation which the work of the department bears to appellant's operations, the Commission disallowed $601,370 of the department's costs allocable to appellant, including $436,315 incurred in the development of vacuum tubes and wireless (or radio) telephony. (R. 240.) The intrastate portion of the $601,370 was $580,575.

The Commission thus states its reason for the disallowance:

> "The State admits that this department does much to benefit the associated companies, but we are of the opinion that numerous expenses and costs claimed are not related to Ohio Bell Telephone operations and do not constitute a proper charge under the license contract. This appears self evident from the nature of the service for which the expenditures are made. We are disposed to and do eliminate and disallow all costs

and expenses incident to the following services and items: picture transmission, television, radio and submarine cable telephone connecting equipment and circuits, radio transmission systems, vacuum tubes, photoelectric cells and submarine cables." (R. 211-2.)

The Commission's statement that this development work was of no benefit to appellant is at complete variance with the evidence.

Appellant has been benefited by instrumentalities already in use in its plant as a result of such development work, as follows:

(a) Improved vacuum tubes.

(b) Transmitters and receivers of higher quality.

(c) The carrier system by means of which there are transmitted simultaneously over one pair of wires numerous telephone messages.

(d) The large use of fine wire cables.

(e) Improved and less expensive loading coils.

(f) The present successful type of handset.

(g) Dial interference elimination. (R. 4127-9; 4139-46.)

Dr. Jewett's testimony shows in detail that the above described instrumentalities were made possible as a result of the development work done in connection with the vacuum tube. (R. 4114-48; 4901-4; 4927-30; 4097.)

All of these instrumentalities are in constant use in all parts of the Bell system. (R. 4128; 4143.)

Since 1925 the use of vacuum tubes has increased rapidly in number and importance of function. (R. 4134-5.)

Vacuum tubes are used to amplify without distortion the electrical waves by which the human voice is transmitted over wire. (R. 4133.) They are as essential to a modern telephone plant as switchboards, wires and poles. Their use has resulted not only in improved service but lower plant costs than otherwise would have been possible. (R. 4096; 4134; 4138; 4143; 4148; 4153.) Vacuum tubes

have had a profound influence upon the transmission of speech over wire. Dr. Jewett's testimony discloses in detail the varied and important uses of these tubes in a modern telephone plant such as appellant's. (R. 4128; 4138.)

Originally invented to serve the needs of telegraphy, they have found a very large use in the field of telephony, principally because of the development work of the department. Their early use was largely confined to long distance telephony, but as new possibilities of use were developed, they revolutionized research work itself and provided the foundation for a dozen or more branches of the telephone art. (R. 4127-30; 4133-4; 4137-9.) They are used in large numbers in local exchange plants in connection with automatically switched-in repeaters, special substation sets for the hard-of-hearing (which includes 10 per cent of the population), local distribution of news and music, time service, teletypewriter units, and in instrumentalities used in locating sources of trouble in the telephone plant. (R. 4145-4148.)

Not only are the instrumentalities resulting from this development work essential to appellant's daily operations, but the work was undertaken by the American Company for the benefit of appellant and other Bell Associate Companies, with the following essential purposes in view:

(1) To maintain such a position that the Bell Associate Companies could not be threatened by any strong patent situation developed in the field of wireless telephony.

(2) To explore that field in order to apply the resulting developments to wire telephony.

(3) To enable the Bell Associate Companies to serve the public by wireless telephony if and when such service may be in the public interest. (R. 4115-8.)

The Commission's disallowances were arbitrary. It substituted its unsupported conclusion that the services

rendered were of no benefit to appellant for the undisputed fact that they were indispensable to the economical and efficient operation of appellant's plant.

The other items of development cost disallowed were on account of research work in respect of submarine cable, television and the like.* This work, all related to the art of telephony, was reasonably undertaken in the public interest and appellant should have been allowed to treat its proportion of the cost as a proper operating expense. In principle, the following language of this Court, in considering the expense of procuring new business, in *West Ohio Gas Co. v. Public Utilities Commission of Ohio* (No. 1) 294 U. S. 63, 72, 79 L. ed. 761, is applicable here:

> "Good faith is to be presumed on the part of the managers of a business. • • • In the absence of a showing of inefficiency or improvidence, a court will not substitute its judgment for theirs as to the measure of a prudent outlay. • • • Within the limits of reason, advertising or development expenses to foster normal growth are legitimate charges upon income for rate purposes as for others. • • • When a business disintegrates, there is damage to the stockholders, but damage also to the customers in the cost or quality of service."

The Commission's attitude in dealing with these and kindred license contract costs was fundamentally unsound. Even if, contrary to the fact, the development and research work had not resulted in improved devices and instrumentalities, it was reasonably undertaken, had direct relation to appellant's business, and the cost thereof was a proper expense. The Commission's action was an unreasonable interference with a prudent outlay, necessary if appellant was to continue to render proper service.

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* More than $100,000 of submarine cable is in use in appellant's plant for river and lake crossings. (Brett Ex. 8, R. 6346.)

Contingent Liability For Patent Infringement.

In the license contract the American Company agreed to hold appellant and other Bell Associate Companies harmless against damages for patent infringement on account of devices recommended by it for use by the Associate Companies. (R. 206; 6794-5.) In order to provide against possible losses resulting therefrom the American Company set up a reserve. The Commission disallowed appellant's allocable part of the charges thereto in the sum of $985,436. (Exs. A 201 B and A 113 B, R. 8843; 8776 B.) The amount allocable to appellant's intrastate business was $953,191.

The Commission's reason for the disallowance was that

> "The possibility of infringement damage is too remote to charge the rate payer for a cost or expense which does not exist and not likely to arise when we consider that during all the years from 1925 to the present time there has been no cost to the American Company in the way of loss or damages because of patent infringements of apparatus used by the patrons of the Ohio Bell Company." (R. 218.)

By the end of 1931 the American Company and its subsidiary, Western Electric Company, owned or controlled outright, or owned licenses under, more than eight thousand United States patents and had over two thousand patent applications pending. (R. 4457.)

Western manufactures and sells to the Associate Companies more than one hundred thousand different piece parts and more than twenty thousand kinds of telephone apparatus. (R. 3915.) This, in conjunction with the rapid growth of the art and consequent patent activity, gave almost unlimited opportunity for patent controversies. There was continuous controversy with other manufacturing companies and inventors, and frequent charges of infringement were made against the Associate Companies. (R. 4462-4.)

During the present case there were pending two patent suits against licensee companies, involving the claim that much of the switching apparatus in every Bell manual central office infringed the plaintiffs' patents. The amount which the plaintiffs expected to recover aggregated several hundred millions of dollars. (R. 4463-4.) Obviously, if plaintiffs should succeed, every Bell Associate Company would be subjected to large claims for damages for which the American Company was, under the license contract, bound to indemnify them.

Against possible losses resulting from its obligation to insure all the Associate Companies against patent infringement liability, the American Company made transfers to a contingent reserve, aggregating, during the period in controversy, $24,395,799. (Ex. A 201 B, R. 8843.)

Whether the provision made by the American Company against this liability was proper both in character and amount, and whether an Associate Company was justified in including in its operating expenses its proper share of the cost thereof was submitted to the Statutory Court in *Illinois Bell Telephone Co. v. Gilbert*, 3 F. Supp. 595, (reversed by this Court on other grounds) on evidence all of which was before the Commission by stipulation in the present case. (R. 724.) That court, after full consideration, approved the provision as proper. The reasons for the approval are thus well stated (p. 604):

> "Under the license contract, the American Company was obligated to insure and hold harmless the plaintiff and all of the other licensee companies against loss or damage from suits or judgments for infringements of any patents, when such infringement was the result of the use of any apparatus recommended to such licensees by the American Company. That obligation constituted a substantial liability and one which might subject the American Company to large losses. The American Company provided for meeting such

possible losses by setting up a contingent reserve over the period from January 1, 1923, to January 1, 1932. Such provision was a reasonable one, and it was proper to distribute the amount so set up over a number of years rather than to charge heavy losses in particular years when incurred. The only practical way by which plaintiff and other licensee companies could make compensation to the American Company for that undertaking was to charge against their revenues fairly equal amounts over the period covered by the undertaking of the American Company."

Treasurer's Department.

This department services the securities of the American Company outstanding in the hands of the public. (R. 3351.) The money obtained from the sale of these securities has been invested by the American Company in the properties of the Associate Companies, including appellant, and in corporations which the American Company has formed to serve those companies, viz., Western Electric Company and Bell Laboratories, Inc. A minor part of the money has been invested in non-license activities. (R. 4234; 4243.) The work of the department in connection with securities consists of the issuance of stocks and bonds, stock transfers, bond registrations, the payment of dividends and interest, correspondence with investors and other related activities. (R. 3351.)

Inasmuch as appellant's treasury is relieved of these costs, the effect of the Commission's disallowance of appellant's proper share is to eliminate one of the necessary costs of operation.

This department also cares for the wages and expenses of the American Company's general departments rendering license contract services. Manifestly some department must perform this service, and to the extent that the research, engineering, advisory and other departmental services are properly attributable to appellant, it should also

be charged with its pro rata share of the cost of handling funds with which to pay the expenses of the departments rendering the services.

Of the total cost of the services of the treasurer's department, the Commission allowed $7,118, and disallowed $397,971. (R. 239.) The intrastate portion of the disallowance was $384,379.

Personnel Department.

The Commission disallowed a portion of the costs of this department allocable to appellant's business, aggregating the sum of $42,953, exclusive of the disallowed item of "Interest on Employees' Benefit Fund," as to which latter item no complaint is here made. (R. 239; 240.) The intrastate portion is $41,504.

The good relations between the management of the Bell System and its employees are a matter of common knowledge. A department to care for relationships with employees is equally as important as one to care for matters of research or engineering. It is not only important to see that the proper items of telephone equipment are developed, conserved and maintained, but fully as important to see that the proper employees are brought into the system, placed in the right capacities and not subjected to improper treatment or undue occupational burdens.

The Personnel Department renders assistance to and cooperates with the Associate Companies in adopting and maintaining measures and methods that will:

> Assure management's consideration of employee point of view in all matters affecting employee interests and encourage employees to discuss with management their individual and group relations.
>
> Enlist interest and develop employee understanding of their responsibilities to the service and to the public.

Provide the training necessary to bring out the best in each individual and encourage the use of educational opportunities.

Develop voluntary thrift habits among employees which will tend to strengthen their economic security and promote good citizenship.

Assure sound practices in matters relating to benefit payments, emergency loans, and retirement pensions.

Develop sound practices in company medical work and promote good-health habits among employees.

The department keeps informed of the trend in industrial relations including major developments in other industries. It administers the benefit and medical work of the American Company. It also maintains contact with the various associations of the non-Bell connecting companies and advises with the Associate Companies in their relations with those companies, all in the interest of the best national telephone service. (R. 3344-7.)

The Commission stated (R. 212) that it appeared to it "that the scope of the work of this Department is rather in the interest of the holding company than that of the licensee"; but its disallowance was obviously due to a misunderstanding of the evidence. This is so because the special training work of the Personnel Department relates to the training of employees of the Associate Companies and of the Long Lines Department of the American Company. In calculating the portion of the cost allocable to the Associate Companies, the portion of the total cost referable to the training of Long Lines employees was deducted. (R. 3337; 3345.) Any incidental training of the staff employees of the general departments of the American Company is wholly minor in extent, but even this work

would properly be assignable to license contract costs, since it applies to American Company employees engaged in license contract activities.

Comptroller's Department.

The Commission disallowed the sum of $200,390 representing a portion of the cost of the Comptroller's Department allocable to appellant's business. (R. 239.) The intrastate portion of the disallowance was $193,580.

This department of the American Company assists in the work of financing temporarily the Associate Companies and of accounting for funds held available to meet their requirements. It keeps general books and records for the purpose of showing the expenses of the twelve departments of the American Company furnishing license contract services. It compiles accounting and statistical information and furnishes it to the Associate Companies. (R. 3348-50.)

The amounts disallowed were chiefly those relating to the general books and records kept by the department, the expenses of the chief statistician and the cost of compiling Bell System Reports. (R. 214.) Of the administrative expenditures of this department the Commission disallowed one-half. (R. 239.)

It is the function of the chief statistician of the American Company to develop methods for use by the Associate Companies, including appellant, in analyzing the various phases of their business, and to develop information for all grades of supervisory employees. He also makes the necessary studies for determining the pension accrual plans of the Associate Companies and studies their fire insurance problems. (R. 3349; 4258.)

The Bell System Reports section is a clearing house for information emanating from the Associate Companies and required by the research and advisory organization of the American Company in order more efficiently to render

the license contract services to such companies. (R. 4259.) No reason is stated in the Commission's finding for the disallowance of appellant's allocable portion of the cost of the chief statistician and the Bell System Reports, and it is difficult to find a reason upon which such a disallowance could be based.

Inasmuch as the twelve departments of the American Company render many license contract services, it is essential that the cost of rendering such services be accurately recorded. It was only appellant's allocable share of that portion of the cost of the Comptroller's Department attributable to license contract service which appellant sought to include in its expenses and which was rejected by the Commission.

III. REFUNDS ARBITRARILY ORDERED.

Assignments of Error 7 and 8.

The Commission ordered appellant to refund the aggregate sum of $11,832,264 for the years 1925 to 1932, inclusive. These refunds were arrived at by the following method:

The Commission first undertook to determine for each of the years 1925 to 1933 the amount, if any, by which appellant's earnings from its entire intrastate business, both toll and exchange, exceeded a fair return on the value of its intrastate property. To do this, the Commission found for each such year, with respect to the intrastate business and property as an entirety:

First. The value of the property.

Second. The fair rate of return.

Third. The dollar amount of such fair return.

Fourth. The revenues, adjusted expenses, and resulting net income.

Fifth. That the resulting net income exceeded the fair return on the property value fixed by the Commission by the following amounts:

1925	$1,822,647
1926	2,041,483
1927	1,986,610
1928	1,925,301
1929	1,463,347
1930	1,481,689
1931	1,659,760
1932	908,335
1933	Nothing
Total	$13,289,172

The Pence law (and the bonds executed pursuant to it) authorize refunds to be made only (a) in the "bond" cases, (b) to the persons whose rates were increased in those cases, and (c) in the amount by which the increases were "unreasonable or excessive." The Commission so understood the statute and undertook to give it effect accordingly. This is in accord with its plain meaning. The bonds given pursuant to the statute, which the Commission approved, were to secure the performance of the obligation as thus defined and are the measure of appellant's obligation. The only rates of appellant which were in suspense and subject to refund were the rates which had been increased in the bond cases. All other rates in the bond cases and all rates, whether increased or not, in the non-bond cases, were lawful and final unless and until other rates for the future were prescribed or authorized by the Commission. They were the lawfully filed rates and were reasonable rates in contemplation of law. No part of the revenues derived from these rates was refundable. Those revenues were the property of appellant.

City of Lima v. Public Utilities Commission, 106 Ohio St. 379, 386, 140 N. E. 147, 149;

Great Miami Valley Taxpayers Assn. v. Public Utilities Commission, 131 Ohio St. 285, 2 N. E. (2d) 777 (June, 1936).

It is clear, therefore, that the total "excess earnings," referable as they were to the entire intrastate property, were not refundable and afforded no basis upon which an order of refund could be made.

Commission's Method of Apportionment.

The Commission, recognizing that under the statute and the decisions of the Ohio Supreme Court refunds could be ordered of revenue attributable to bonded rates only, next undertook, by means of an accounting apportionment hereafter discussed, to determine for each year the refundable portion of the $13,289,172 of total excess intrastate earnings. The decision here under review purports to accomplish this and orders appellant to make refunds to persons whose rates were increased under bond, in the following amounts:

Year	Exchange	Toll
1925	$1,137,195	$232,282
1926	1,637,314	176,845
1927	1,823,857	Nothing
1928	1,772,238	"
1929	1,344,624	"
1930	1,357,589	"
1931	1,519,405	"
1932	830,915	"
1933	Nothing	"
Total	$11,423,137	$409,127

These refunds, arrived at as they were by the apportionment method, were ordered to be made without any find-

ing by the Commission for any year of the property value, or net income in the bond cases.

It is appellant's contention here, as it was before the Commission (R. 395-401; 344-6), and in the Supreme Court of Ohio (R. 96-8; 450-4), that the method employed by the Commission for ascertaining the refundable portion of the excess earnings was wholly arbitrary and has resulted in overstating by more than $4,000,000 the amount which appellant could be required to refund.

An understanding of the method used by the Commission fully sustains this contention.

The refundable portions of the excess earnings were fixed by an apportionment based on *gross exchange revenues*. To make the apportionment the Commission ascertained for each year:

First. The total amount of gross exchange revenues collected in all of appellant's exchanges.

Second. The amount of gross exchange revenues collected in appellant's exchanges where one or more of the increases in rates were collected under bond.* (In none of these exchanges were all of the rates under bond. R. 8429-8574.)

Third. The percentage relation of the gross exchange revenues in the exchanges where bonds were in effect to the total gross exchange revenues.

Having ascertained this percentage, the Commission applied it to the total excess earnings which it found appellant had had from its entire intrastate business and ordered the resulting amount to be refunded as representing the portion of the excess earnings collected under bond. (R. 3738-57; 3760-76; 3797-3800; Wood Exs. 21 and 22 and Wood Report of August 11, 1934, R. 8193-8212.)

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* In 1925 there were 37 out of 153 exchanges in which one or more rates had been increased under bond. Due to additional Pence Law filings there were 45 such exchanges in 1928. (R. 378.)

Errors in Commission's Method.

The purpose of the apportionment was to ascertain the refundable portion of the excess earnings or, in other words, what portion of the excess earnings was attributable to the bonded increases.

There are at least three vices inherent in the Commission's method:

First, it adopted, as the basis for the apportionment of excess net earnings, appellant's total *gross* exchange revenues, which, since they bore no relation to appellant's total *net* earnings, or to its *net* earnings in the bond or non-bond cases, afforded no basis upon which an apportionment of excess net earnings could be made. Also, although the Commission's method undertook to apportion a part of the excess earnings to toll refunds, all toll revenues were left out of the calculation.

Second, the Commission counted or treated as revenues collected under bond, all revenues, whether bonded or not, of each exchange where any rate was collected under bond. It thereby increased for each year the percentage to be applied to that year's excess earnings, and required appellant to refund more than $4,000,000 of revenues not collected under bond.

Third, although the Commission's apportionment method took into consideration *exchange* revenues only, no account of toll revenues being taken, a part of the excess earnings found for two of the years (1925 and 1926) were apportioned to appellant's toll business and toll refunds ordered for those years. For these refunds there was no factual basis.

With respect to the first proposition:

In making the apportionment the Commission, after rejecting appellant's offer to prove that its earnings referable to its bonded rates were reasonable (See page 12, *supra*),

proceeded to apportion the excess net earnings between the bonded and non-bonded rates solely upon the basis of gross exchange revenues, on the assumption that an apportionment based on gross revenues would fairly reflect the amount of net earnings.

In *The Minnesota Rate Cases*, 230 U. S. 352, 459, 57 L. ed. 1511, this Court, condemning the use of gross earnings for apportioning or dividing property values as between interstate and intrastate use, said (p. 459):

> "In support of this method, it is said that a division of the value of the property according to gross earnings is a division according to the 'value of the use,' and therefore proper. But it would seem to be clear that the value of the use is not shown by *gross* earnings. The gross earnings may be consumed by expenses, leaving little or no profit. If, for example, the intrastate rates were so far reduced as to leave no net profits, and the only profitable business was the interstate business, it certainly could not be said that the value of the use was measured by the gross revenues."

By a parity of reasoning, in the present case the gross earnings furnish no valid basis for a division or apportionment of excess earnings (which of course are net earnings) as between the bond and non-bond cases. Not only is there no evidence to support such a division or apportionment but, to the contrary, the record discloses that appellant's more than 150 exchanges located in the cities and towns of Ohio are operated under varying conditions in respect of population, number of telephones per community and use of classes of service, and that the cost of rendering the service varies proportionately as between the larger communities and the smaller ones. (R. 124-5; 4171; 4096; 191; 6240; 6243-4; 1625; 1630; 8429-8574.)

Appellant's revenue for the years 1925 to 1932 in exchanges where there were no increases collected under

bond amounted to approximately $25,000,000. (R. 6347; 6348.)

The Commission's apportionment method gives no consideration to net earnings, to the varying amounts of bonded increases as between different classes of rates and different sizes of exchanges, to the relation which an increased rate bore to the pre-existing rate, to the character of the several exchanges furnishing the service, or to the cost of rendering that service. The method used had no substantial relation to the object sought to be accomplished, viz., the determination of excess net earnings in the bond cases, and was therefore purely arbitrary.

By making the apportionment of excess earnings (which included earnings from both the toll and the exchange property) on the basis of gross exchange revenue, the Commission excluded from consideration $51,470,911 of toll revenue, of which only $4,981,394, or less than 10%, represented increases in toll rates collected under bond. (R. 8733.)

With respect to the second proposition:

In none of appellant's exchanges where rates were increased under bond were *all* of the rates increased. (R. 8429-8574.) In many of the exchanges only a few of the rates were so increased. (R. 8429-8574.) For example, in the Cleveland exchange the increases collected under bond represented less than 1% of the total exchange revenues of that exchange.

Nevertheless, in making the apportionment, the Commission treated or counted as bonded revenue all exchange revenue in every exchange where any rate was increased under bond. (R. 3740; 8193-8212.)

Thus for the Cleveland exchange alone the Commission treated as bonded revenue more than $102,000,000

which had not been collected under bond and with respect to which appellant could not be required to make refunds. The testimony of Commission's witness, Wood, and appellant's witness, Brett, and their exhibits show the following in connection with the Cleveland Exchange revenues:

CLEVELAND EXCHANGE

Year	Total Exchange Service Revenues	Increases Collected Under Bond	Non-Bonded Revenues Counted as Bonded Revenues
1925	$ 10,569,289	$ 86,717	$ 10,482,572
1926	11,382,795	92,976	11,289,819
1927	12,070,390	99,160	11,971,230
1928	12,903,220	102,841	12,800,379
1929	14,317,661	113,937	14,203,724
1930	14,713,833	118,367	14,595,466
1931	14,573,563	115,487	14,458,076
1932	13,146,846	108,515	13,038,331
Total	$103,677,597	$838,000	$102,839,597

(Brett Ex. 9, R. 6356.)

The result of the Commission's treatment of the $102,839,597 of non-bonded revenue of the Cleveland exchange as bonded revenue was to increase the refunds by more than $4,000,000. That this is true appears from the following table:

Year	Exchange Service Revenues: Company Total	Cleveland Exchange	% of Total (3 ÷ 2)
(1)	(2)	(3)	(4)
1925	$ 24,554,400.	$ 10,569,289.	43.044379%
1926	26,628,407.	11,382,795.	42.746812
1927	28,617,757.	12,070,390.	42.177974
1928	30,447,906.	12,903,220.	42.378021
1929	33,431,682.	14,317,661.	42.826625
1930	34,422,892.	14,713,833.	42.744325
1931	33,722,537.	14,573,563.	43.216093
1932	30,038,321.	13,146,846.	43.766914
Total	$241,863,902.	$103,677,597.	

Year	Total Excess Earnings Found by Commission	Excess Earnings Attributable to Cleveland by Commission's Method (6×4)	Total Possible Refunds in Cleveland i.e. Total Increases Collected under Bond	Excess Refunds Ordered, due to the Use of All Cleveland Revenues as Bonded Revenues (7—8)
(5)	(6)	(7)	(8)	(9)
1925	$ 1,822,647	$ 784,547	$ 86,717	$ 697,830
1926	2,041,483	872,669	92,976	779,693
1927	1,986,610	837,912	99,160	738,752
1928	1,925,301	815,904	102,841	713,063
1929	1,463,347	626,702	113,937	512,765
1930	1,481,689	633,338	118,367	514,971
1931	1,659,760	717,283	115,487	601,796
1932	908,335	397,550	108,515	289,035
Total	$13,289,172	$5,685,905	$838,000	$4,847,905

(Compiled from Reports of Aug. 11, 1934 of Commission's witness, Wood, Exhibit 9 of Appellant's witness, Brett, and Finding of January 16, 1934; R. 8210A-11; 6356; 244.)

If appellant had not increased any of its rates in Cleveland under bond and had thus reduced its revenue in Cleveland for the eight-year period by only $838,000, no refunds could have been ordered in Cleveland, and in such case the Commission admittedly could not have included as bonded revenue any portion of Cleveland exchange revenues. Thus, under the Commission's method of apportionment appellant by increasing its rates in Cleveland to the extent of only $838,000 has lost the sum of $4,847,905, due to the Commission's counting, as bonded revenue, all revenue collected in that exchange. Surely a method which makes such a result possible is wholly arbitrary.

With respect to the third proposition:

As heretofore shown, the Commission's apportionment method was based upon gross *exchange* revenues only, no account having been taken of toll revenues and no consideration having been given to the value of the toll property or net income therefrom. (R. 3740; 3748; 3773; Wood Exs. 21, 22, and Wood Report of August 11, 1934, R. 8193-8212.) There was, therefore, no possible basis upon which toll refunds could be ordered. But, after having ordered exchange refunds totaling the entire amount of exchange increases collected under bond for the years 1925 and 1926, $409,127 remained. This amount, which could not be absorbed by way of exchange refunds, was thereupon arbitrarily assigned to toll refunds and ordered repaid to toll patrons. (R. 3754; 3757; 3762; Wood Exs. 21, 22 and Wood Report of August 11, 1934, R. 8193, 8194-8212.) This was done in accordance with the apportionments made by the Commission's accountant, Wood, who admitted that the amount ordered refunded to toll patrons was merely the "leftover," not absorbable by way of exchange refunds. (R. 3757; 3762.)

This was not a case where a sum of money was admittedly due to a number of persons and the debtor had no

interest in the distribution of the amount owed by him among the several claimants. On the contrary, it was a case where, as heretofore pointed out, appellant's obligation was to refund only that portion of the bonded increase in rates which the Commission might determine to have been excessive.

Appellant was, therefore, vitally interested in the determination of the amount of the refunds. It had the undoubted right under the Ohio law to collect and retain for its own uses all revenues not collected under bond. The Commission had no authority to deal with such revenues or to order refunds with respect thereto.

In conclusion on this subject, (a) the Commission, in arriving at the refundable portion of the excess earnings, used a method based solely upon appellant's gross exchange revenues, having no real relation to appellant's actual net earnings, and thus ascertained upon a wholly arbitrary basis that portion of appellant's excess earnings attributable to the bond cases; (b) it also treated as bonded revenue more than $100,000,000 of revenue not in fact bonded and, as a result, required appellant to refund more than $4,000,000 of excess earnings not in fact referable to rates collected under bond; (c) the Commission's order requiring appellant to refund more than $400,000 to its toll patrons had no factual basis upon which it could rest. This amount was an accidental residue arbitrarily assigned to toll refunds as a "leftover."

The Commission's action in these respects amounted to a denial of due process of law because based on no evidence.

Baltimore & Ohio Railroad Co. v. United States, 264 U. S. 258, 68 L. ed. 667.

IV. SEPARATION OF PROPERTY, REVENUES AND EXPENSES.

Appellant made a careful separation of its property, revenues and expenses as between its interstate and intrastate business on the basis of use, in conformity with the decision in *Smith v. Illinois Bell Telephone Co.*, 282 U. S. 133, 75 L. ed. 255.

The separation was accepted by the Commission and used as the basis of its findings. Its correctness is not questioned. (R. 51.)

V. VALUATION.

Assignments of Errors 11, 12 and 13.

The Commission's property valuation was erroneous in the following particulars*:

(1) Omitted Land.

On June 30, 1925 appellant owned seven parcels of land of the aggregate value (intrastate) of $586,959, all purchased as sites for telephone exchange buildings.

On some of the parcels telephone buildings were already under construction on the date certain. (R. 3214.) Within a reasonable time thereafter, all of the parcels were in actual use. (R. 233.)

There is shown below in column (1) the value of the intrastate portion of each parcel and in column (2) the date when the buildings under construction thereon were finished and placed in service:

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* The errors considered in this section are in addition to the point argued *supra*, pages 25 to 37 with reference to the use of price trends.

Parcel	(1) Value	(2) Buildings Finished and Cut into Service
No. 17—Columbus	$ 2,362	April, 1925
No. 21—Cleveland	33,635	June, 1926
No. 8—Toledo	154,776	April, 1927
No. 19—Cleveland	300,945	May, 1927
No. 18—Columbus	19,728	February, 1928
No. 1—Springfield	21,867	October, 1928
No. 17—Cleveland	53,646	December, 1929
Total	$586,959	

(R. 233; 243.)

The Commission recognized the propriety of appellant's purchase and use of this land, by including each parcel in the rate base for the year in which the building on the parcel was placed in active service, but refused so to include any parcel until that year, thus undervaluing appellant's intrastate property in 1925, 1926, 1927 and 1928 in the respective sums of $586,959, $550,962, $95,241 and $53,646. (R. 233; 243.)

Parcels of land purchased by a public utility as sites for buildings or other structures reasonably necessary to serve the public must be included in the rate base where, as here, they have been purchased for use prior to the date certain and are used in serving the public within a reasonable time thereafter.

Denver Union Stock Yard Co. v. United States, 57 F. (2d) 735;

Brooklyn Borough Gas Co. v. Prendergast, 16 F. (2d) 615;

Pacific Telephone & Telegraph Co. v. Whitcomb, 12 F. (2d) 279.

In *Denver Union Stock Yard Co. v. United States*, the Statutory Court enjoined a rate order of the Secretary of Agriculture because, among other things, of his refusal to include in the rate base unimproved parcels of land acquired for stockyard expansion, material yards, additional trackage facilities and railroad car storage deemed necessary by the company for use in the reasonably near future. The court said (p. 746):

> "By denying the petitioner a right to earn a return thereon, the Secretary has, as a practical matter, denied the petitioner the right to own them, for it is mathematically certain that, if the petitioner is not permitted to earn a return upon the value of such properties, it cannot afford to keep them. • • •.
>
> "To have waited until the adjacent property was improved, or until the owners could have taken advantage of its imperative need, would be to saddle upon the patrons an extravagant and unnecessary load."

The exclusion of this land from the rate base cannot be justified, as the Commission attempts, on the ground that the Ohio statutes do not specifically authorize its inclusion.•

> *Columbus Gas & Fuel Co. v. Public Utilities Commission of Ohio*, 292 U. S. 398, 404, 78 L. ed. 1327.

The Commission's refusal to include this land in the rate base until the buildings were placed in active service denied appellant an opportunity to earn a return on property in which it had been required to invest its money in order to meet the public demand for service.

• Sections 499-8 to 499-12, inclusive; appendix hereto, pages xxix to xxxiii.

(2) Going Value.

In its finding of tentative value as of June 30, 1925 the Commission made a separate allowance of $3,592,040 for going value, equal to 3¾% of the reproduction cost new. (R. 144; 147.) Of that amount the intrastate portion was $3,490,905.

In its final value as of June 30, 1925, the Commission eliminated its previous allowance for going value, made additional reductions in the tentative value of approximately $4,000,000 and no increases. (R. 247.)

The issue in respect of going value calls for a consideration of the history and circumstances of the particular enterprise.

Los Angeles Gas & Electric Corp. v. Railroad Commission, 289 U. S. 287, 314, 77 L. ed. 1180;
Dayton Power & Light Co. v. Public Utilities Commission of Ohio, 292 U. S. 290, 309, 78 L. ed. 1267.

Appellant's Experience at its Collected Rates.

Appellant was formed in 1921 by the consolidation of the former Ohio Bell Telephone Company and The Ohio State Telephone Company. (Hagenah Ex. 1, R. 6541; 6542; Company Ex. X-3, R. 6358.)

At its collected rates, including the portion found to be excessive, appellant from its organization in 1921 to the end of the period under investigation had paid dividends on its common stock at an average annual rate of 5.27%. For no year of the period did the dividends exceed 7%. (R. 8364; 8414-5; 8418, Wood Exs. 1 and 4, R. 8171; 8174.) Appellant's entire capitalization, approved by the Commission, has never exceeded its investment. (Wood Ex. 1, R. 8171; 8361; 8364; 8414; 8415; Uprichard Ex. 4, R. 7397; Eide Ex. 1, R. 6489; 8338.)

For 1925, appellant's reserve for accrued depreciation amounted to $12,156,070, which was 13.87% of the cost of the intrastate depreciable property, and $2,000,000 short of the amount deducted by the Commission from the reproduction cost new of the entire intrastate property on account of existing depreciation as of the date certain. (See table page 15, *supra.*)

During the period 1925 to 1933, the depreciation reserve ranged from a low of 10.37% of the cost of the depreciable property to a high of 13.93%. (See table *supra*, p. 15.)

As of June 30, 1925 appellant's corporate surplus amounted to $3,759,829 and on November 30, 1933, the end of the period, it was $2,813,345. (Wood Ex. 1; R. 8171; and R. 8416.)

The foregoing history reflects appellant's operations at its collected rates, of which the Commission's final order would require the refund of approximately $12,000,000 with interest.

Property.

Appellant's property represents a large integrated aggregate of many classes and kinds of telephone plant. It is a well conceived project, favorably located. Its construction and equipment are modern. It is efficiently operated, well managed and has shown an earning power if granted reasonable rates. (R. 2080.) In 1925 it had more than 500,000 telephones in service and a trained organization of 12,100 employees engaged in the construction, maintenance and operation of its plant. (R. 191; 1343; Uprichard Ex. 5, R. 7398.)

Going Value—Commission's Tentative Finding.

Except for minor adjustments, the Commission arrived at the tentative value as of June 30, 1925 by adopting for the several physical property costs, direct and overhead, the estimates of its engineer, Hagenah, and to those costs added its allowance of 3¾% for going value. (R. 144; 147.)

Hagenah had made a separate allowance for going value because none of his other costs, direct or overhead (indirect), contained any amount or allowance for that item. (R. 2186.) They were physical property costs only. The same was true with respect to the costs, direct and overhead, of all of the other appraisal witnesses. (R. 830; 831; 1189; 1205; 1759; 2186; 2783.)

In view of such evidence a separate allowance for going value was inevitable, the Commission in its findings of tentative value saying:

> "The Commission wishes to reiterate that this estimate of going concern value is fixed in this case under our view that the Commission is bound by the evidence in the record * * *." (R. 139.)

Going Value—Commission's Final Finding.

In its final finding of value as of June 30, 1925, the Commission disallowed *in toto* the tentative finding for going value and further reduced the tentative finding by $4,000,000. (R. 173; 247.)

Between the dates of the two findings there had been no change in the pertinent evidence.

The resulting final value of the intrastate property as of the date certain was in the aggregate more than $7,600,000 below the tentative value. (R. 196, 247.)

It was more than $5,000,000 below the cost of the property including the Commission's allowance for working capital and supplies.

The course followed by the Commission in reaching its final finding without any amount for going value, is worthy of note.

Hagenah's direct and overhead physical property costs were more than $12,000,000 below appellant's costs, the latter based on its recent experience in large construction projects. (R. 1105-6; 1758-9; 2066.)

In its tentative finding the Commission adopted Hagenah's physical property costs, direct and overhead, presumably because they were the lowest credible costs in the record.

The physical property costs thus adopted contained no allowance for going value. (R. 2186.)

Recognizing that those costs contained no such allowance, the Commission in its tentative finding added to Hagenah's costs the 3¾% for going value.

The effect was to establish the existence of a going value in the property and to concede that no allowance for it had been made in the Commission's physical property costs.

In the final value, still using the same or lower costs containing nothing for going value, and disallowing entirely its previous allowance for that element, the Commission labeled the resulting amount "fair value."

What had become of the substantial going value previously found to exist in the property or where an allowance therefor in any amount was to be found in the final value, the Commission did not say.

Manifestly, a final value thus made up of costs from which any amount or allowance for going value has been excluded cannot, in the nature of things, fairly be said to be *large enough* to satisfy the constitutional requirement that

there must be an actual allowance in good faith in the rate base for that value. The narrow issue here is, whether, measured by the evidence, the rate base "was in fact large enough" to embrace a fair allowance for going value.

Los Angeles Gas & Electric Corp. v. Railroad Commission, 289 U. S. 287, 317, 77 L. ed. 1180.

It is immaterial whether the allowance for going value is or is not so labeled. Nevertheless, where the record affirmatively shows, first, the inclusion of a separate allowance for going value because there was no allowance for it in the other costs; later the exclusion of that specific allowance and the substitution of nothing in its place; and finally, no possible room elsewhere in the rate base for any amount representing that element of value, the claim that somewhere, in some way, there is present in the final value some amount or allowance for going value merely denies the realities. In the face of the record here, such a claim is futile. Constitutional guaranties cannot be satisfied by mere gestures.

On the facts, the fair value in the instant case is the antithesis of that in *Los Angeles Gas & Electric Corp. v. Railroad Commission, supra.* There the Commission's fair value or rate base was greater by $5,000,000 than the historical cost of the property undepreciated. Here the rate base was more than $5,000,000 *below cost.* (See table page 15, *supra.*)

In the opinion in that case, at page 317, the Court said:

> "this excess amount of over $5,500,000 can appropriately be assigned to elements of value which may not have been fully covered • • • and thus the entire excess may be regarded as applicable to whatever intangible value the property had as a going concern."

In the present case no amount can be so assigned. There is no such excess. In the Commission's final value,

bottomed as it is upon costs containing nothing for going value, there could not be any amount or allowance for that item. *Measured by the evidence*, there is nothing in the final value beyond tangible, physical property costs.

In *Denver v. Denver Union Water Co.*, 246 U. S. 178, 62 L. ed. 649, the master's allowance for going value was approved because (p. 192):

> "the master expressly declared that his detailed valuation of the physical property and water rights included no increment because the property constituted an assembled and established plant, doing business and earning money; and a careful examination of his very elaborate report convinces us that this is true. The amount allowed by him on this account is not open to serious question from the standpoint of appellants."

If there be substituted for the master's valuation in that case the physical property costs of the Commission's engineer, adopted in the instant case, the situation presented by the two cases is the same.

In *McCardle v. Indianapolis Water Co.*, 272 U. S. 400, 71 L. ed. 316, the Indiana Commission added a substantial amount for going value because in the physical property costs its engineer had included nothing for that element. That is precisely what the Commission did in the tentative value in the instant case, only to undo it in the final value.

That a going value existed in appellant's property in a substantial amount was established by the evidence of every witness testifying on the subject. They included Sloan, Williams and Schneider for appellant, and Hagenah for the Commission. (Schneider Ex. 3, R. 7121-7228A; Williams Ex. 9, R. 8159-60; Sloan Ex. A-1, R. 7388-90A; Hagenah Ex. 2, R. 6605; 1333-1367; 1368-1370; 1759-1772; 2075-2090.)

No one denied that the property had a going value.

In the tentative findings the Commission found that it had. In the final findings, although conceding that the

property had a going value, the Commission merely concluded:

> "We therefore now hold that the amount, tentatively allowed by the Commission, of $3,592,040.00 as going concern value should be eliminated as a separate item." (R. 173.)

But the issue cannot be avoided by the mere statement that the going value should be eliminated "as a separate item." That implies that elsewhere in the final value the going value has been allowed for. The facts refute the implication.

(3) Western Electric Price Increase.

Except for an increase of approximately 10% effective November 1, 1930, the Commission approved as fair the prices paid by appellant to Western Electric Company for telephone apparatus throughout the period. (R. 165; 169.) The Commission also found that Western's profits in its Bell system business were reasonable. (R. 165; 168.)

The prices approved included the following substantial price reductions: 1925, 1.1%; 1926, 8.7%; 1927, 4.9%; 1928, 10.3%; and 1929, 8.6%. (Ex. X-13A, R. 8966; 3488.)

What weighting was given to Western's prices in the trended values of appellant's property is not disclosed in the order. The Commission refused to permit any investigation of the subject. (R. 273; 275; 312; 373; 387; 722.) It is admitted, however, that Western's reduced prices were given some weighting and its increased prices none:

Western's reductions were made at a time when other manufacturers were maintaining or increasing their prices. (R. 3982.) A reduction made shortly prior to 1930 was based upon an expected increase in Western's Bell sales, but when in 1930 it became apparent that the expected increase would not occur, the 10% price increase effective November 1, 1930 became necessary. (R. 3982.)

Western's earnings on investment and profit on sales vary from year to year due to several factors, one of the most important of which is the capacity at which its plants are operated. These factors cause substantial variations in its annual profits. (R. 3877.)

Even with Western's increased prices effective November 1, 1930, it earned only 4.3% and 3.9% on investment in its Bell business for the years 1930 and 1931, respectively, and for the year 1932 it sustained a loss in excess of $6,400,000. (R. 4410; Ex. A-194; R. 8839A.)

Whenever Western could reduce its prices to appellant it did so, and as long as the reductions continued, the Commission found the prices to be fair. When, however, Western made a necessary increase in prices, the Commission rejected the increase as unfair.

(4) Failure To Give Fair Consideration To Cost Or Reproduction Cost.

The Commission fixed the tentative value of appellant's property as of June 30, 1925, the date certain, at $104,282,735, of which $101,346,634 represented the value of the intrastate portion on the basis of the separation later adopted by the Commission. (R. 147; 243.)

The final value of the intrastate property as of June 30, 1925, was fixed at $93,707,488, a reduction of $7,639,146 from the tentative finding.* (R. 196; 247.)

The final value gave no consideration to reproduction cost new.

In 1925 telephone costs in Ohio had reached a new level *from 55% to 60% above that of 1913, most of the increases having taken place in 1916 and thereafter.* (R. 2117.) The evidence showed that the new level probably would continue for several years, as it in fact did. (R. 2117.) Although it

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* The details of this reduction are shown at page 7, *supra*.

is impossible to evaluate the total appreciation in appellant's property due to this change in price level, the following facts show that the reproduction cost of appellant's property in 1925 greatly exceeded its recorded book cost.

The average cost of plant per telephone in Ohio increased from $173 in 1921 to $200.51 at the close of 1925, an increase of $27.51 per station. (Commission's witness Hagenah, R. 2116.)

Only four witnesses testified to the cost to reproduce the entire property. They were Sloan, Williams and Schneider for appellant and Hagenah for the Commission.* In the main the differences between appellant's witnesses and Hagenah arose out of the fact that in arriving at their respective labor costs appellant's witnesses used its costs experienced in recent large construction projects, whereas Hagenah used theoretical costs, lower than appellant's, on the ground that there would be savings in a wholesale reproduction program. (R. 2064; 2069.) On that account, and almost solely on that account, Hagenah's reproduction cost was lower than that of appellant's witnesses by more than $12,000,000. (R. 2066.) Even his estimate of the reproduction cost new, less depreciation and going value, was approximately $5,000,000 above the Commission's final finding of $93,707,488. (R. 231; 2095; 2088.) It is submitted that in view of the increase in reproduction cost over book cost in 1925, shown above, Hagenah's estimate of value was the minimum which the Commission was entitled to adopt. In any event, the Commission was not justified in finding a value which was $5,000,000 less than his estimate for that year.

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* Another witness, Allensworth, submitted a partial appraisal. The Commission adopted none of his costs, presumably because he was unacquainted with telephone values in Ohio during the period in controversy. (R. 2693; 2823; 2805.)

Appellant's Valuation Offer.

Although the evidence showed the substantial increase in price levels occurring since the installation of the major portion of appellant's plant, appellant did not seek a finding of value reflecting all of that increase. On April 15, 1930, before the Commission had fixed the tentative or final values, appellant offered to accept, as fair value, its property cost undepreciated, including construction work in progress and cash working capital. (R. 139.) If this offer had been accepted, appellant's intrastate property would have been valued at approximately $101,000,000, compared with the Commission's tentative value of $101,346,634, and as against the final value of $93,707,488. (R. 147; 243; 231.)

Such a value, although substantially below the reproduction cost new less depreciation of the property, would have given appellant the benefit of some portion of the increase in value due to the permanent change in price levels testified to by the Commission's engineer.

In conclusion on the question of value, the following table (see page 15, *supra*) shows how the Commission disregarded the cost of the property in arriving at values for the years under investigation:

	Commission's Value Including Allowance for Working Capital and Supplies	Average Cost Plus Commission's Allowance for Working Capital and Supplies
1925	$ 93,707,488	$ 98,798,259
1926	101,767,774	107,424,541
1927	111,036,522	118,526,298
1928	122,417,735	131,597,552
1929	134,765,576	143,380,043
1930	145,683,047	156,319,161
1931	145,271,663	163,153,973
1932	133,625,655	163,723,323
1933	126,250,206	162,403,661

For the errors pointed out appellant urges that the judgment of the Supreme Court of Ohio be reversed and that Court directed to reverse the orders of the Commission.

Respectfully submitted,

KARL E. BURR,
W. H. THOMPSON,
W. B. STEWART,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Counsel for Appellant.

CHARLES M. BRACELEN,
Of Counsel.

March 6, 1937.

APPENDIX.

Pence Law, p. i

§ 614-23 of the General Code, p. iv

Commission's Detailed Valuation of June 30, 1925, p. vii

Commission's Application of Trends, p. ix

License Contract Costs Allowed and Disallowed, p. xi

Commission's Order of September 6, 1934, p. xix

Valuation Sections, Ohio General Code, p. xxix

Pence Law.

The Pence Law, Section 614-20, passed April 4, 1923, 110 Ohio Laws, 366, which amended the Robinson Law, is as follows:

> "Unless otherwise ordered by the commission, no change shall be made in any rate, joint rate, toll, classification, charge or rental in force at the time this act takes effect, or as shown upon the schedules which shall have been filed by a public utility in compliance with the requirements of this act, or by order of the commission, except after thirty days' notice, in writing, to the commission, which notice shall plainly state the changes proposed to be made in the schedule then in force, and the time when the change, rate, charge, toll, classification, or rental shall go into effect; and all proposed changes shall be plainly indicated upon existing schedules, or by filing new schedules thirty days prior to the time when they are to take effect, but the commission may prescribe a less time when they may take effect, provided, however, that if the proposed change shall effect an increase in the rate, joint rate, toll, classification, charge or rental, notice, in form approved by the commission, published once each week for three consecutive weeks before the effective date thereof, unless the commission shall authorize a less time, shall be given by publication in a newspaper published at the county seat of each county in which such change applies, and of general circulation therein, or in one newspaper published in, and of general circulation throughout the territory in which such utility operates.

Such published notice shall set forth the fact that such application has been made, the effective date of the proposed new schedule, the name and location of the agent of the utility in such county or territory where a copy of such proposed new schedule may be inspected by any interested party; and provided, further, however, that such utility shall at the time of the filing of the schedule with the commission, place on file with such agent of such utility a copy of the proposed new schedule and keep the same on file for the inspection of any interested party pending the hearing before such commission.

Whenever there shall be filed with the commission any schedule effecting an increase in any rate, joint rate, toll, classification, charge or rental, or stating any new regulation or practice affecting any existing rate, joint rate, toll, classification, charge or rental in force at the time this act takes effect, the commission shall have, and it is hereby given authority, either upon complaint or upon its own initiative without complaint, at once, and if it so orders without answer or other form of pleading by the interested public utility, but upon reasonable notice, to enter upon a hearing concerning the propriety of such rate, joint rate, toll, classification, charge, rental, regulation or practice; and pending such hearing and the decision thereon, the commission upon filing with such schedule and delivering to the public utility affected thereby, a statement in writing of its reasons for such suspension, shall suspend the operation of such schedule and postpone the use and operation of such rate, joint rate, toll, classification, charge, rental, regulation or practice, but not for a longer period than one hundred and twenty days from the time when such schedule was filed with the commission; and after a full hearing, whether completed before or after the rate, joint rate, toll, classification, charge, rental, regulation or practice goes into effect, the commission may make such order in reference to such rate, joint rate, toll, classification, charge, rental, regulation or practice as would be proper in a proceeding initiated after the rate, joint rate, toll, classifica-

tion, charge, rental, regulation or practice had become effective; provided, that if any such hearing cannot be concluded within the period of suspension, as above stated, such rate, joint rate, toll, classification, charge, rental, regulation or practice shall go into effect at the end of such period of suspension upon the public utility filing with the commission a bond, undertaking or other security, to the satisfaction of the commission, securing and guaranteeing the repayment, with interest at the rate of six per centum per annum from the date of payment by the consumer to the date of repayment by the utility, to all the consumers of such portion of such increased rate, joint rate, toll, classification, charge or rental, collected by such utility as the commission, upon final hearing, may determine to have been unreasonable or excessive, which repayments shall be made at such times and in such amounts as the commission shall order, and shall be promptly paid by said utility to the corporations or persons entitled thereto, and in such manner as the commission may prescribe, and if any such money ordered by the commission to be repaid shall not have been claimed by the corporations or persons entitled thereto, within one year from the time the same shall become due and payable in accordance with the order of the commission, all such moneys shall be paid by the utility to the treasurer of the county, or other political subdivision, in which such new schedule is effective for the benefit of its general fund, in such amounts and in such manner as the commission may order; and thereafter such public utility shall not be liable therefor. Such bond, undertaking or security shall be in such amount as the commission may from time to time determine; provided, however, that the amount fixed at any time shall not, in addition to the amount of such increase or other charge made by the utility already accrued, exceed the estimated amount of such increase or other charge made by the utility extending over a period of one year, based upon the business of the utility for the previous year, or be less than one-half of such estimated amount.

All rates, joint rates, tolls, classifications, charges or rentals of a public utility heretofore or hereafter fixed and determined by any order of the commission under the provisions of this chapter shall be in force and be prima facie lawful for two years from their effective date or until changed or modified as provided by law; provided, however, that after any such rate, joint rate, toll, classification, charge or rental shall have been in force for a period of two years, the same may be changed by the public utility affected in the manner provided in this section; and that nothing herein contained shall be construed as in any way affecting the right of any person or public utility to make application, as provided in sections 614-21 and 614-23 of the General Code or otherwise as provided by law, for an order rescinding, altering or amending any order of the commission within said two year period or thereafter.

At any hearing involving a rate increased or sought to be increased after this section shall have become effective, the burden of proof to show that the increased rate or the proposed increased rate is just and reasonable shall be upon the public utility and the commission shall give to the hearing and decision of such question, preference over other questions pending before it, and decide the same as speedily as possible."

Section 614-23 of the General Code of Ohio.

Section 614-23, which confers upon the Commission authority to fix rates, and which limits that authority to rates for the future, is as follows:

"Whenever the commission shall be of the opinion, after hearing, that any rate, fare, charge, toll, rental, schedule, classification or service, or any joint rate, fare, charge, toll, rental, schedule, classification, or service rendered, charged, demanded, exacted or proposed to be rendered, charged, demanded, or exacted is, or will be, unjust, unreasonable, unjustly discriminatory or unjustly preferential or in violation

of law, or the service inadequate, or that the maximum rates, charges, tolls, or rentals chargeable by any such public utility are insufficient to yield reasonable compensation for the service rendered, and are unjust and unreasonable, the commission shall, with due regard among other things, to the value of all of the property of the public utility actually used and useful for the convenience of the public, excluding therefrom the value of any franchise or right to own, operate or enjoy the same in excess of the amount (exclusive of any tax or annual charge) actually paid to any political subdivision of the state or county, as the consideration for the grant of such franchise or right; and exclusive of any value added thereto by reason of a monopoly or merger and to the necessity of making reservation out of the income for surplus, depreciation and contingencies, and all such other matters as may be proper, according to the facts in each case, fix and determine the just and reasonable rate, fare, charge, toll, rental or service to be thereafter rendered, charged, demanded, exacted or collected for the performance or rendition of the service, and order the same substituted therefor; and thereafter, no change in the rate, fare, toll, charge, rental, schedule, classification or service, shall be made, rendered, charged, demanded, exacted or changed by such public utility without the order of the commission and any other rate, fare, toll, charge, rental, classification or service shall be deemed and held to be unjust and unreasonable, prohibited and unlawful. Upon application of any person or any public utility, and after notice to the parties in interest and opportunity to be heard as provided in this act for other hearings, has been given, the commission may rescind, alter or amend an order fixing any rate or rates, fare, toll, charge, rental, classification or service, or any other order made by the commission. Certified copies of such orders shall be served and take effect as provided for original orders."

Commission's Detailed Finding of Value for 1925

APPENDIX A OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

SUMMARY OF FINAL VALUATION AS OF JUNE 30, 1925

Line No.	Acct. No.	Description	Reproduction Value	Percent Condition	Present Value
1.	207	Right of way	$1,243,034	100.00	$1,243,034
2.	211	Land	3,256,854	100.00	3,256,854
3.	212	Buildings	7,788,774	90.18	7,023,924
4.		Total Land and Buildings	$11,045,628	Ave. 93.08	$10,280,778
5.	221	Central Office Telephone Equipment	17,199,740	85.75	14,748,777
6.	222	Other Equipment of Central Offices	634,689	84.72	537,709
7.		Total Central Office Equipment	$17,834,429	Ave. 85.71	$15,286,486
8.	231	Station Apparatus	5,759,956	85.68	4,935,086
9.	232	Station Installations	2,034,423	80.00	1,627,538
10.	233	Interior Block Wires	83,881	80.00	67,105
11.	234	Private Branch Exchanges	3,384,995	85.75	2,902,633
12.	235	Booths and Special Fittings	167,201	80.00	133,761
13.		Total Station Equipment	$11,430,456	Ave. 84.56	$9,666,123
14.	241	Exchange Pole Lines	9,412,432	72.93	6,864,844
15.	242	Exchange Aerial Cable	8,055,194	87.71	7,064,968
16.	243	Exchange Aerial Wire	4,556,220	76.72	3,495,338
17.	244	Exchange Underground Conduit	9,386,032	95.00	8,916,730
18.	245	Exchange Underground Cable	9,810,730	91.85	9,011,082
19.	246	Exchange Submarine Cable	19,730	95.00	18,744
20.		Total Exchange Lines	$41,240,338	Ave. 85.77	$35,371,706
21.	251	Toll Pole Lines	6,108,489	80.93	4,943,325
22.	252	Toll Aerial Cable	536,254	91.50	490,692
23.	253	Toll Aerial Wire	3,842,664	91.78	3,526,696
24.	254	Toll Underground Conduit	30,493	95.00	28,968
25.	255	Toll Underground Cable	421,257	91.64	386,032
26.	256	Toll Submarine Cable	12,652	95.00	12,019
27.		Total Toll Lines	$10,951,809	Ave. 85.72	$9,387,732
28.	261	Office Furniture and Fixtures	624,244	85.00	530,607
29.	263	General Store Equipment	18,181	85.00	15,454
30.	264	General Stable and Garage Equipment	652,331	75.00	489,248
31.	265	General Tools and Implements	422,051	70.00	295,436
32.		Total General Equipment	$1,716,807	Ave. 77.51	$1,330,745
33.		Total Physical Property	$95,462,501	Ave. 86.49	$82,566,604
		Undistributed Construction Expenditures:			
34.		Omissions 1%	814,570	Ave 85.58	697,120
35.		Interest During Construction..... 6%	5,727,750	" 86.49	4,953,996
36.		Engineering 5%	3,243,948	" 85.67	2,779,056
37.		Taxes During Construction..... 1%	954,625	" 86.49	825,666
38.		General Expenses 2%	1,909,250	" 86.49	1,651,332
39.		Total Undistributed Construction Expenditures	$12,650,143	Ave. 86.22	$10,907,170
40.		Total Fixed Capital	$108,112,644	Ave. 86.46	$93,473,774
41.		Working Capital Including Materials & Supplies	2,948,502	100.00	2,948,502
42.		Total Property Used and Useful	$111,061,146	Ave. 86.82	$96,422,276
		Less,—			
43.		Interstate Proportion of Total.....2.81552%	3,126,949	" 86.82	2,714,788
44.		Intrastate Property Used and Useful...97.18448%	$107,934,197	Ave. 86.82	$93,707,488

Commission's Application of Trends

APPENDIX B OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

VALUATION OF PROPERTY USED AND USEFUL FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE AND TRENDS OF SUCH VALUATION.

	June 30, 1925	Last 6 Mos. 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931	Year 1932	11 Mos. 1933
Fixed Capital										
All Items Except Right of Way and Restored Land Values—										
1. Final Valuation Fixed by Commission	$92,118,867									
2. Trended Value First of Period—Percent of Line 6	.....	100.00% A	98.73% B	96.97% C	99.20% D	101.45% E	95.65% F	93.95% G	88.71% H	102.96% I
3. Trended Value First of Period—Amount	.....	$92,118,867	$96,311,536	$100,642,148	$116,752,169	$129,566,975	$137,815,645	$142,265,570	$129,465,177	$130,552,050
4. Net Additions During Period—Per Books at 100%	.....	5,431,559	7,475,355	17,051,571	10,962,937	14,516,292	13,547,388	3,730,462	2,666,372*	1,254,329*
5. Trended Value End of Period	92,118,867 A	97,550,426 B	103,786,891 C	117,693,719 D	127,715,106 E	144,083,267 F	151,363,033 G	145,942,032 H	126,798,806 I	129,297,721
Right of Way:										
6. Book Value plus Undistr. Constr. Exp. End of Period—at 100%	1,354,907	1,421,549	1,418,728	1,420,376	1,500,557	1,579,461	1,712,919	1,743,117	1,782,806	1,754,696
Restored Land Values:										
7. Trended Value End of Period—Per Appendix "C"	.....	2,430	36,570	484,401	521,174	685,999	644,061	606,085	536,771	556,172
8. Total Fixed Capital End of Period	$93,473,774	$98,974,405	$105,242,189	$119,598,496	$129,737,137	$146,328,727	$153,720,003	$148,290,234	$129,118,382	$131,608,588
	6-30-25		6-30-26	6-30-27	6-30-28	6-30-29	6-30-30	6-30-31	6-30-32	6-30-33
Average Fixed Capital:										
9. Based Upon Line 8, First and End of Period	93,473,774		102,106,297	112,420,342	124,667,816	138,032,992	150,024,365	151,005,118	138,704,308	130,263,485
Working Capital Including Materials and Supplies										
10. Average Per Appendix "E"	2,948,502		2,923,583	3,062,701	3,218,291	3,451,024	3,250,138	2,804,990	2,497,696	3,044,894
Total Property Used and Useful										
11. Total Lines 9 and 10	96,422,276		105,031,880	115,473,043	127,886,107	141,483,956	153,274,503	153,810,108	141,202,004	133,408,379
Less—										
12. Interstate Proportion of Total	2,714,788		3,264,086	4,438,621	5,468,372	6,718,380	7,591,456	8,538,445	7,576,349	7,158,173
13. Intrastate Property Used and Useful	$93,707,488		$101,767,774	$111,036,522	$122,417,735	$134,765,576	$145,683,047	$145,271,663	$133,625,655	$126,250,206

NOTE—The composite percentages shown on Line 2 were developed by the Commission's Engineers and represent the relation of values for each current period to the preceeding period and they have been applied to the basic figures bearing corresponding alphabetical designations.

The total property used and useful shown on Lines 11 to 13 inclusive is forwarded to the rate study on Appendix "M". Interstate and Intrastate Allocations have been made on the basis of percentages shown on Appendix "L".

Line 6 includes undistributed construction expenditures at 6-30-25 added to book figures in all columns as follows: 6% interest during construction, $74,582—Taxes during construction, $12,430—General expenses, $24,861—Total, $111,873. There is also included a book deduction covering re-classification during the 11 months of 1933 in the amount of $3,630.

*Indicates red figures.

APPENDIX G OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

COST OF A. T. & T. COMPANY LICENSE CONTRACT SERVICES ALLOWED AS A DEDUCTION FROM REVENUES UNDER ACCT. 527—LICENSEE REVENUE—DR.—FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE

Costs Allowed	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929
1. A. T. & T. Co. departmental expenses—Appenix "H"	$308,536	$332,039	$381,589	$419,986	$442,627
2. Office space and furniture expense	3,157	731	837	912	974
3. Instrument maintenance	61,291	81,311	86,754	.....	.....
4. Instrument depreciation	51,793	56,506	58,882	.....	.....
5. Return on instruments	95,300	103,970	108,343	.....	.....
6. Total costs allowed	$520,077	$574,557	$636,405	$420,898	$443,601
Payments Made					
7. Licensee Revenue—Dr.—(Acct. 527) per books.	1,274,052	1,277,944	1,402,144	752,524	626,184
Expense Allowed					
8. Line 6 or 7, whichever is lower	520,077	574,557	636,405	420,898	443,601

Costs Allowed	Year 1930	Year 1931	Year 1932	Year 1933	
9. A. T. & T. Co. departmental expenses—Appendix "H"	$532,473	$520,006	See Note .		
10. Office space and furniture expense	1,015	1,078			
11. Instrument maintenance	.....	.....			
12. Instrument depreciation	.....	.....			
13. Return on instruments	.....	.....			
14. Total costs allowed	$533,488	$521,084	$521,084	$521,084	
Payments Made					
15. Licensee Revenue—Dr.—(Acct. 527) per books.	638,043	619,171	545,057	466,923	
Expense Allowed					
16. Line 14 or 15, whichever is lower	533,488	521,084	521,084	466,923	

NOTE: As there is no evidence in the record concerning costs for 1932 and 1933, they have been estimated at the same amount as for 1931.

Payments made of Licensee Revenue—Dr.—for 1933 have been estimated on the basis of payments for the eleven months ended November 30, 1933.

The amounts on lines 8 and 16 are forwarded to Exhibit "F", lines 5 and 24.

APPENDIX H OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

A. T. & T. COMPANY DEPARTMENTAL EXPENSES ALLOWED AND DISALLOWED AS PART OF COST OF LICENSE CONTRACT SERVICES FOR EACH YEAR FROM 1925 TO 1931, BOTH INCLUSIVE.

	Dept. No.	Proportion	Reference to Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Departmental Expenses Allowed										
1. Operation and Engineering	No.	1—Entire	A-108-B	$121,300	$131,722	$141,563	$154,161	$168,039	$176,470	$164,528
2. Development and Research	No.	2—Partial	A-117-B	100,387	108,968	131,464	147,267	160,696	230,916	235,932
3. Information	No.	3—None	A-124-B							
4. Personnel	No.	4—Partial	A-150 & 151-B	14,824	17,526	28,572	30,782	34,845	35,291	33,886
5. Public Relations	No.	5—None	A-153-B							
6. Treasurer	No.	6—Partial	A-154-B	606	680	1,214	958	1,119	1,281	1,260
7. Comptroller	No.	7—Partial	A-155-B	22,752	24,620	26,088	27,202	29,315	30,626	30,505
8. Secretary	No.	8—None	A-156-B							
9. Administrative Including Sundry	No.	9—One-half	A-157-B	14,361	14,106	16,336	14,586	15,558	14,384	12,923
10. General Service Bureau	No.	10—One-half	A-158-B	7,023	8,063	8,277	8,890	9,833	10,443	9,535
11. Operation—General	No.	11—None	A-159-B							
12. Legal	No.	12—Entire	A-160-B	27,283	26,354	28,075	36,140	23,222	33,062	31,437
13. Total Allowed			A-170-B, Line A	$308,536	$332,039	$381,589	$419,986	$442,627	$532,473	$520,006
Departmental Expenses Disallowed										
14. Operation and Engineering	No.	1—None	A-108-B							
15. Development and Research	No.	2—Partial	A-117-B	39,613	56,032	75,536	69,733	109,304	149,084	102,068
16. Information	No.	3—Entire	A-124-B	31,184	35,103	31,514	41,441	55,377	54,324	52,365
17. Personnel	No.	4—Partial	A-150 & 151-B	9,120	9,853	7,776	6,196	6,778	6,845	5,674
18. Public Relations	No.	5—Entire	A-153-B	1,129	1,086	1,086	1,120	1,444	1,932	1,483
19. Treasurer	No.	6—Partial	A-154-B	35,525	50,871	39,768	61,266	59,818	91,774	58,949
20. Comptroller	No.	7—Partial	A-155-B	22,721	24,647	26,936	29,436	31,332	33,508	31,810
21. Secretary	No.	8—Entire	A-156-B	2,389	2,453	2,348	2,571	2,639	2,527	2,038
22. Administrative Including Sundry	No.	9—One-half	A-157-B	14,361	14,106	16,335	14,585	15,559	14,385	12,922
23. General Service Bureau	No.	10—One-half	A-158-B	7,023	8,063	8,278	8,890	9,832	10,443	9,535
24. Operation—General	No.	11—Entire	A-159-B	8,694	9,682	9,349	10,113	10,857	11,147	10,071
25. Legal	No.	12—None	A-160-B							
26. Total Disallowed			A-170-B, Line A	$171,759	$211,896	$218,926	$245,351	$302,940	$375,969	$286,915
Total Departmental Expenses										
27. As Shown on Appendix "J", Line 26				$480,295	$543,935	$600,515	$665,337	$745,567	$908,442	$806,921
NOTE—The amounts on line 13 are forwarded to Appendix "G", lines 1 & 9. The partial amounts allowed on line 7 cover the following items:										
Comptroller—Dept. No. 7—										
Bell System Methods			A-155-B	$9,473	$10,437	$11,215	$11,412	$12,381	$13,022	$12,595
Chief Traveling Auditor			A-155-B	7,397	7,492	7,688	8,355	8,735	8,928	9,283
Chief Accountant			A-155-B	1,341	1,451	1,681	1,669	2,097	2,214	2,107
Proportion of Undistributed			A-155-B	3,735	4,476	4,623	4,778	5,162	5,511	5,509
Proportion of Administration			A-155-B	806	764	881	988	940	951	1,011
Total Allowed—Line 7				$22,752	$24,620	$26,088	$27,202	$29,315	$30,626	$30,505

The partial amounts disallowed on lines 15, 17, 19 and 20 are detailed on Appendix "I".

APPENDIX I OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307.

DETAILS OF PARTIAL AMOUNTS OF A. T. & T. COMPANY DEPARTMENTAL EXPENSES DISALLOWED FOR EACH YEAR FROM 1925 TO 1931, BOTH INCLUSIVE.

	Reference To Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Development and Research—Dept. No. 2								
Picture Transmission	A-118-B	.....	$5,989	$5,911	$4,188	$3,458	$4,321	$7,408
Television	A-118-B	.....	1,324	10,067	3,339	5,519	3,717	3,270
Radio and Subm. Cable Tele. Conn. Eq. & Cets.	A-118-B	.....	.....	.....	.....	.....	11,961	11,339
Radio Transmission Systems	A-118-B	30,397	35,252	43,571	44,529	66,611	83,203	46,424
Vacuum Tubes	A-118-B	9,216	12,389	11,469	12,812	11,206	14,333	14,903
Photo Electric Cells	A-118-B	.....	1,078	620	1,222	1,415	1,251	2,920
Submarine Cable	A-118-B	.....	.....	3,898	3,613	21,095	27,298	15,804
Total Disallowed—Appendix "H" Line 15		$39,613	$56,032	$75,536	$69,733	$109,304	$149,084	$102,068
Personnel—Dept. No. 4								
Special Training	A-150-B	2,716	2,934	2,393	2,605	2,888	2,885	2,276
"Other" Items Shown in Col. 4	A-150-B	1,419	1,619	1,504	1,591	1,740	1,652	1,224
Public Relations	A-150-B	599	611	610	636	703	683	638
"Other" Items Shown in Col. 4	A-151-B	748	1,071	1,206	1,364	1,447	1,625	1,536
Interest on Empl. Benefit Fund	Heiss No. 10 Supl.	3,608	3,618	2,063	.....	.....	.....	.....
Total Disallowed—Appendix "H" Line 17		$9,120	$9,853	$7,776	$6,196	$6,778	$6,845	$5,674
Treasurer—Dept. No. 6								
Direct Distribution of Securities	III. N. R. 861	2,133	16,587	2,993	22,201	15,478	36,456	5,033
Servicing Securities	III. N. R. 864	28,868	29,489	29,671	31,548	36,976	41,903	40,169
Handling Funds and Making Advances	III. N. R. 863	2,483	2,506	3,133	3,285	3,617	4,111	4,274
Financing General Department	III. N. R. 862	1,616	1,631	2,039	2,137	2,354	2,675	2,782
Handling Employees' Stock Plan	III. N. R. 862	425	658	1,932	2,095	1,393	6,629	6,691
Total Disallowed—Appendix "H" Line 19		$35,525	$50,871	$39,768	$61,266	$59,818	$91,774	$58,949
Comptroller—Dept. No. 7								
General Books and Records	A-155-B	4,942	5,367	5,957	6,432	7,100	7,926	7,850
Chief Statistician	A-155-B	10,205	11,032	12,207	13,455	14,353	15,090	14,242
Bell System Reports	A-155-B	3,033	3,001	3,088	3,311	3,358	3,421	2,918
Proportion of Undistributed	A-155-B	3,735	4,481	4,774	5,169	5,516	6,031	5,745
Proportion of Administration	A-155-B	806	766	910	1,069	1,005	1,040	1,055
Total Disallowed—Appendix "H" Line 20		$22,721	$24,647	$26,936	$29,436	$31,332	$33,508	$31,810

APPENDIX J OF COMMISSION'S FINDINGS OF JAN. 16, 1934.

THE OHIO BELL TELEPHONE COMPANY—FORMAL CASE NO. 3307

TOTAL A. T. & T. COMPANY DEPARTMENTAL EXPENSES AND FAIR PROPORTION THEREOF ALLOCABLE TO THE OHIO BELL TELEPHONE COMPANY AS SHOWN ON PAGE 223 OF COMPANY'S BRIEF FOR EACH YEAR FROM 1925 TO 1931, BOTH INCLUSIVE, AS CLAIMED BY COMPANY

	Dept. No.	Reference to Record	Year 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931
Total Departmental Expenses		A-103 & 170-B	$2,963,159	$3,301,306	$3,562,940	$3,813,983	$4,102,105	$4,340,568	$4,234,967
1. Operation ond Engineering	No. 1	A-117-B	3,402,573	4,130,418	5,182,815	5,289,081	6,738,114	9,260,867	8,655,309
2. Development and Research	No. 2	A-124-B	738,027	854,747	786,989	1,031,629	1,344,765	1,349,439	1,305,138
3. Information	No. 3	A-150 & 151-B	605,523	707,960	938,415	924,418	1,056,306	1,100,273	1,080,695
4. Personnel	No. 4	A-153-B	26,232	25,860	25,850	26,038	32,987	45,405	35,317
5. Public Relations	No. 5	A-154-B	888,219	1,298,847	1,036,942	1,549,332	1,495,599	2,349,694	1,553,145
6. Treasurer	No. 6	A-155-B	1,117,884	1,241,284	1,341,620	1,410,248	1,488,481	1,619,429	1,607,471
7. Comptroller	No. 7	A-156-B	59,725	62,817	60,452	65,040	65,881	64,965	53,526
8. Secretary	No. 8	A-157-B	706,094	710,799	826,665	726,324	763,731	726,445	666,682
9. Administrative, incl. Sundry	No. 9	A-158-B	345,309	406,307	418,879	442,702	482,643	527,394	491,918
10. General Service Bureau	No. 10	A-159-B	211,565	240,549	233,029	254,250	268,793	277,792	273,631
11. Operation—General	No. 11	A-160-B	668,165	659,735	720,319	936,315	591,505	861,264	817,142
12. Legal	No. 12								
13. Total			$11,730,495	$13,640,629	$15,134,915	$16,469,360	$18,430,910	$22,523,535	$20,774,941
Allocable to the Ohio Bell Tel. Co.		A-108-B	$121,300	$131,722	$141,563	$154,161	$168,039	$176,470	$164,528*
14. Operation and Engineering	No. 1	A-117-B	140,000	165,000	207,000	217,000	270,000	380,000	338,000
15. Development and Research	No. 2	A-124-B	31,184	35,103	31,514	41,441	55,377	54,324	52,365
16. Information	No. 3	A-150 & 151-B	23,944	27,379	36,348	36,978	41,623	42,136	39,560
17. Personnel	No. 4	A-153-B	1,129	1,086	1,086	1,120	1,444	1,932	1,483
18. Public Relations	No. 5	A-154-B	36,131	51,551	40,982	62,224	60,937	93,055	60,209
19. Treasurer	No. 6	A-155-B	45,473	49,267	53,024	56,638	60,647	64,134	62,315
20. Comptroller	No. 7	A-156-B	2,389	2,453	2,348	2,571	2,639	2,527	2,038
21. Secretary	No. 8	A-157-B	28,422	28,212	32,671	29,171	31,117	28,769	26,845
22. Administrative, incl. Sundry	No. 9	A-158-B	14,046	16,126	16,555	17 780	19,665	20,886	19,070
23. General Service Bureau	No. 10	A-159-B	8,694	9,682	9,349	10,11n	10,857	11,147	10,071
24. Operation—General	No. 11	A-160-B	27,283	26,354	28,075	36,140	23,222	33,062	31,437
25. Legal	No. 12								
26. Total			$480,295	$543,935	$600,515	$665,337	$745,567	$908,442	$806,921*

NOTE—The portions of lines 14 to 26, inclusive, which are allowed and disallowed are shown on Appendix "H".

* $10,000.00 added to correct error in figures shown in Company's brief.

COMMISSION'S ORDER OF SEPT. 6, 1934.

This day after full hearing, due notice of the time and place of which was given to all parties in interest, this matter came on for further consideration upon the order made and entered herein as of date July fifth, 1934, the objections and protests thereto; the representations and showing made at said hearing, and the report, dated August 11, 1934, with accompanying exhibits, of Special Investigator E. W. Wood, which report and accompanying exhibits hereby are made a part of the record herein.

And the Commission, coming first to consider the application and petition of said The Ohio Bell Telephone Company asking, for the reasons and upon the grounds set forth therein, among other things, a rehearing with respect to the matters and things decided and determined by the finding and order made and entered herein upon July fifth, 1934, as aforesaid, finds that sufficient cause has not been made to appear in said application and petition for such rehearing and does hereby deny the same.

To which action of the Commission in denying its said application and petition for such rehearing, said The Ohio Bell Telephone Company then excepted, here now excepts, and its exceptions here are noted of record.

And the Commission, coming now to consider the application and request of said The Ohio Bell Telephone Company that it disclose to respondent and afford it an opportunity to examine, analyze, explain and rebut certain information, and to introduce certain evidence, with respect to the matters and things decided and determined by said finding and order dated July fifth, 1934, and the Commission having heretofore incorporated into the record herein and accorded said respondent ample opportunity to exam-

ine and consider all necessary and pertinent information requested in said application, finds that the same should be, and hereby is overruled.

To which action of the Commission in overruling its said application and request, said The Ohio Bell Telephone Company then excepted, here now excepts and its exceptions here are noted of record.

And the Commission, coming now to consider the verified return of said The Ohio Bell Telephone Company to the order to show cause contained in the Commission's findings and order of July fifth, 1934, and the prayer thereof, finds that said return and the prayer thereof should be and hereby are overruled.

To which action of the Commission in overruling said verified return and the prayer thereof, said The Ohio Bell Telephone Company then excepted, here now excepts and its exceptions here are noted of record.

And the Commission, coming now to consider the matters herein now at issue as set forth in the first paragraph of this finding and order, finds that the finding as to excess intrastate toll charges collected under bond in Advanced Utility Rate Proceeding No. 124, set forth in the finding and order of July fifth, 1934, as the sum of $510,142.00 for the year 1925 and the sum of $234,399.00 for the year 1926, should be corrected to read the respective sum of $232,282.00 for the year 1925 and the sum of $176,845.00 for the year 1926.

The Commission, therefore, further finds:

That the excess charges collected under bond as provided by law in protesting exchanges, for local exchange service, is found to be as follows:

1925	$ 1,137,195.00
1926	1,637,314.00
1927	1,823,857.00
1928	1,772,238.00
1929	1,344,624.00
1930	1,357,589.00
1931	1,519,405.00
1932	830,915.00
Total	$11,423,137.00

That the excess charges collected under bond, as provided by law, for intrastate toll services for the following years is found to be as follows:

1925	$232,282.00
1926	176,845.00
Total	$409,127.00

That excess collections in the sum of $11,423,137.00 for exchange service and $409,127.00 for excess collections of intrastate toll services are refundable and subject to repayment by the Company to the subscribers and patrons paying the same;

That said $11,423,137.00 excess collections are refundable to and subject to repayment to the subscribers and patrons of said utility of the various protesting exchanges to the extent of the amount, for each exchange and for the respective years aforesaid, as shown by the schedule hereto attached, identified as Schedule A, and made a part of this finding;

That the subscribers and patrons of said utility in said protesting exchanges paying said excess charges for local exchange service are entitled to have repayment made to them in such sum as is equal to the following percent of the increase paid by them for the respective years aforesaid:

1925	100.00000%
1926	100.00000%
1927	95.59084%
1928	88.52068%
1929	62.67606%
1930	62.12778%
1931	73.06314%
1932	46.34134%

That the excess charges from intrastate toll service for the years 1925 and 1926, aforesaid, shall be repaid to the subscribers and patrons paying the same in the ratio of the increased charges of the respondent, The Ohio Bell Telephone Company, to the total excess collections, and any such refunds apportioned to connecting companies should, by such connecting companies, be repaid to their respective patrons or, if not claimed by such patrons within one year from the date payable, paid to the public treasury as hereinafter provided;

That the repayment of excess intrastate toll service charges be made to the persons, subscribers and patrons paying the same, notwithstanding payments for said services were made by such persons and patrons to telephone companies other than The Ohio Bell Telephone Company because of the interchange of telephonic services;

That interest at the rate of 6% per annum from the date of payment by the respective subscribers and patrons of said excess charges be paid to said subscribers and patrons on the amount so refundable and to be repaid to the date of repayment by the utility;

That such repayment shall be made within ninety days herefrom, in cash and/or credit upon existing indebtedness, to the subscribers and patrons entitled

thereto and if any such money to be repaid shall not have been claimed by the subscribers or patrons entitled thereto within one year from the time the same shall become due and payable, all such unclaimed money shall be paid by said The Ohio Bell Telephone Company to the Treasurer of the County or other political subdivision in which such new schedule is effective for the benefit of its general fund, and

That all findings and orders heretofore made pertaining to excessive charges and collections insofar as the same may conflict with this finding shall be so modified as to conform to this finding.

It is, therefore,

ORDERED, That said The Ohio Bell Telephone Company be, and hereby it is notified, directed and required, within ninety days herefrom, to refund in cash and/or credit upon existing indebtedness to each of its subscribers and patrons within each of the communities enumerated in Exhibit A, appended hereto, the excess or the proportion of the excess or increase which it collected under the bonds duly given in the Advanced Utility Rate Proceedings, enumerated in said Schedule A within each of the years set forth from the year 1925 to and including the year 1932, as prescribed in said Schedule A, which hereby is made a part of this order as fully as if the same were here rewritten, and to all patrons who used intrastate toll service within the State of Ohio in the years 1925 and 1926, the total excess collections of $232,282.00 for the year 1925 and of $176,845.00 for the year 1926, in the ratio of the increased charges of The Ohio Bell Telephone Company to the total excess collections made by it under bond for all intrastate toll service rendered by The Ohio Bell Telephone Company individually and jointly with connecting companies, together with

interest thereupon at the rate of six per centum per annum from the date of payment by the respective subscribers and patrons of said excess charges to the date of such repayment;

Provided, however, that if any of such money so ordered repaid including proportions of the excess intrastate toll collections apportioned to connecting companies, shall not have been claimed by the subscribers and patrons of The Ohio Bell Telephone Company and of its connecting companies, entitled thereto within one year from the time the same shall become due and payable, in accordance with this order, all such unclaimed money shall forthwith be paid by said The Ohio Bell Telephone Company to the Treasurer of the County or other political subdivision in which said new schedule is effective, to the benefit of its general fund. It is, further,

ORDERED, That all protests and objections to the finding of July fifth, 1934, herein, inconsistent with this order be, and hereby the same are, overruled.

To which order of the Commission, the objections of said parties were then noted and here are noted of record.

And it appeared further that certain of the Advanced Utility Rate Proceedings consolidated in this proceeding involve proposed increased rates which were proffered for filing prior to the initial date for the making of refunds as prescribed herein, it is, further,

ORDERED, That said The Ohio Bell Telephone Company be, and hereby it is notified, directed and required, within sixty days herefrom, to report to this Commission the amount of increase in rates which it had collected from the date of the filing of its bond until the first day of January, 1925, in each of the exchanges involved in the said Advanced Utility Rate Proceedings, consolidated herein, which were instituted prior to January 1, 1925. It is, further,

ORDERED, That within thirty days after the completion of such refunds, said The Ohio Bell Telephone Company make verified report of same to this Commission. It is further,

ORDERED, That jurisdiction of this matter be, and hereby is, retained for the purpose of making such audit or further order herein as may be necessary and proper in the premises.

THE PUBLIC UTILITIES COMMISSION OF OHIO,

FRANK W. GEIGER,
CHARLES F. SCHAEBER,
Commissioners.

(Seal)

Dated at Columbus, Ohio,
This 6th day of September, 1934.

A true copy:

C. H. KNISLEY,
Secretary.

SCHEDULE A.

THE OHIO BELL TELEPHONE COMPANY

FORMAL CASE NO. 3307

PROPORTION OF AMOUNTS COLLECTED UNDER EXCHANGE SERVICE BONDS, AS REPORTED BY COMPANY, WHICH REPRESENT EXCESSIVE RETURN ON EXCHANGE SERVICE AS FOUND BY COMMISSION.

Exchange	Effective Date	A.U.R.P.	1925	1926	1927	1928	1929	1930	1931	1932	Total
Akron,	8-1-24	138	142,887.	148,320.	152,486.	154,832.	122,856.	124,652.	138,562.	76,958.	1,061,553.
Alton,	1-1-25	160	341.	357.	372.	348.	271.	330.	425.	296.	2,740.
Bridgeport,	9-1-25	197									
Bellaire,	9-1-25	196	10,496.	30,850.	29,653.	26,767.	19,435.	19,693.	21,738.	11,552.	170,184.
Martins Ferry,	9-1-25	199									
Canfield,	11-1-25	205	455.	2,666.	2,548.	2,383.	1,679.	1,639.	1,875.	1,074.	14,319.
Canton,	2-1-27	252	—	—	75,171.	77,371.	59,221.	59,498.	64,594.	33,093.	368,948.
Cleveland,	8-1-24	142	86,717.	92,976.	94,788.	91,036.	71,411.	73,539.	84,378.	50,287.	645,132.
Columbus,	3-1-26	214	—	374,673.	445,663.	426,841.	314,927.	311,957.	354,116.	198,739.	2,426,916.
Coshocton,	10-1-26	237	—	2,229.	8,488.	7,845.	5,652.	5,531.	6,345.	3,686.	39,776.
Dayton,	8-1-24	141	268,119.	280,943.	293,214.	294,061.	227,274.	235,440.	268,639.	150,456.	2,018,126.
Dublin,	1-1-25	164	943.	947.	950.	919.	715.	754.	897.	568.	6,693.
East Palestine,	1-1-25	157	3,551.	3,542.	3,475.	3,325.	2,365	2,338.	2,656.	1,539.	22,791.
Gahanna,	1-1-25	161	1,280.	1,168	1,102.	1,011.	792.	875.	1,025.	618.	7,871.
Galloway,	1-1-25	165	787.	7[illegible]	697.	657.	459.	454.	482.	322.	4,580.
Girard,	10-1-24	149	1,917.	2,020.	1,997.	1,926.	1,396	1,387.	1,484.	779.	12,906.
Groveport,	1-1-25	170	2,012.	1,798.	1,733	1,626.	1,195.	1,240.	1,355.	835.	11,794.
Harrisburg,	1-1-25	166	1,690	1,627.	1,513	1,358.	992.	969.	1,084.	637.	9,870.
Hilliards,	1-1-25	167	1,072.	1,073.	1,052.	945.	815.	910.	1,070.	584.	7,521.
Kent,	9-1-25	198	4,753.	14,724.	14,348.	13,912	10,328.	10,557.	12,039.	7,006.	87,667.
Lancaster,	12-1-20	40	13,626.	14,115.	13,843.	13,008.	9,220	9,117.	10,561.	6,368.	89,858.
Lockbourne,	1-1-25	168	721.	627.	552.	489	258.	221.	217.	125.	3,210.
London,	10-1-26	238	—	493.	1,888.	1,704.	1,165.	1,067.	1,206.	713.	8,236.
Marietta,	8-1-24	136	19,753.	19,946.	18,678.	16,987	12,133	12,304.	13,311.	7,696.	120,808.
Massillon,	8-1-24	132	39,540.	41,322.	41,769.	39,611.	29,696.	29,124.	31,297.	16,852.	269,211.
Mentor,	10-1-26	240	—	162.	649.	593.	419.	435.	602.	375.	3,235.
Middletown,	8-1-24	137	43,933.	45,694.	45,272.	43,361	32,479.	32,996.	36,996.	21,147.	301,878.
New Albany,	1-1-25	163	1,013.	981.	925.	834.	610.	628.	736.	400.	6,127.
Niles,	10-1-24	147	6,119.	6,000.	5,523.	5,320.	3,996.	3,989.	4,143.	2,131.	37,221.
Osborn,	10-1-25	204	123.	492.	470.	435.	308.	306.	359.	228.	2,721.
Pickerington,	1-1-25	171	879.	853.	828.	813.	600.	462.	553.	340.	5,328.
Piqua,	9-1-24	143	12,110.	12,111.	11,588.	10,898	7,907.	7,774.	8,791.	4,992.	76,171.
Reynoldsburg,	1-1-25	169	1,678.	1,644.	1,639.	1,583.	1,228.	1,298.	1,476.	890.	11,436.
Ripley,	1-1-21	42	888.	915.	871.	825.	585.	559.	640.	393.	5,676.
Sedalia,	10-1-26	241	—	32.	125.	111.	77.	75.	82.	43.	545.
South Charleston,	1-1-25	159	934.	935.	909.	817.	589.	544.	601.	351.	5,680.
South Solon,	1-1-25	172	220.	199.	186.	153.	88.	85.	99.	58.	1,088.
Springfield,	4-1-26.	218	—	39,723.	51,138.	47,835	36,534.	36,713.	40,337.	21,564.	273,844.
Steubenville & Mingo Junction	9-1-24	146	22,014.	22,963.	22,558.	21,553.	16,007	15,984.	17,591.	9,280.	147,950.
Toledo,	8-1-24	139	261,624.	270,064.	269,534.	258,054.	193,480.	192,064.	209,111.	106,839.	1,760,770.
Toronto,	12-1-24	156	2,182.	2,297.	2,362.	2,355.	1,715.	1,743	1,930.	896.	15,480.
Washington Court House,	10-1-26	242	—	2,040.	7,758.	7,258.	5,034.	4,878.	5,432.	3,040.	35,440.
Worthington,	1-1-25	162	5,307.	5,184.	5,209.	5,305.	4,018.	4,347.	5,204.	3,231.	37,805.
Youngstown,	6-1-24	135	177,511.	187,887	190,333	185,173.	144,695.	149,113.	165,366.	83,954.	1,284,032.
Total,			1,137,195.	1,637,314.	1,823,857.	1,772,238.	1,344,624.	1,357,589.	1,519,405.	830,915.	11,423,137.
Refundable Proportion of Increase Collected			100.00000%	100.00000%	95.59084%	88.52068%	62.67606%	62.12778%	73.06314%	46.34134%	

VALUATION SECTIONS, OHIO GENERAL CODE.

Section 499-8.

The commission, for the purpose of ascertaining the reasonableness and justice of rates and charges for the service rendered by public utilities or railroads of this state, or for any other purpose authorized by law may investigate and ascertain the value of the property of any public utility or railroad in this state, used or useful for the service and convenience of the public. At the request of the council of any municipality the commission after hearing and determining that such a valuation is necessary may also investigate and ascertain the value of the property of any public utility used and useful for the service and convenience of the public where the whole or major portion of such utility is situated in such municipality. Every public utility or railroad shall furnish to the commission, its engineers, experts or other assistants from time to time and as the commission may require maps, profiles, contracts, reports of engineers and other documents, records and papers or copies of any or all of the same, in aid of any investigation and ascertainment of the value of its property, and shall grant to the commission or its agents free access to all of its premises and property and its accounts, records and memoranda whenever and wherever requested by any such duly authorized agent, and every public utility or railroad is hereby directed and required to cooperate with and aid the commission in the work of the valuation of its property in such further particulars and to such extent as the commission may require and direct. The commission shall have such power to make all rules and regulations, as to it may seem necessary, to ascertain the value of each and every utility or railroad in the state.

Section 499-9.

The commission shall prescribe the details of the inventory of the property of each public utility or railroad in the state; and such inventory shall include all the kinds and classes of property, with the value of each, owned by each public utility or railroad, used and useful for the service and convenience of the public. In ascertaining the value of the various kinds and classes of property of each public utility or railroad, the commission shall have authority to ascertain and report in such detail as it may deem necessary as to each piece of property owned or used by such public utility or railroad to show separately the following facts:

A. The original cost, if any, of each parcel of land owned and used by such public utility or railroad, and a statement of the conditions of acquisition; whether by direct purchase, by donation, by exercise of the power of eminent domain or otherwise.

B. The value as of a date certain, of each parcel of land owned and used by such public utility or railroad, by comparison with the value of contiguous and neighboring parcels of land, and land of similar character as to location and use.

C. If there shall be any additional value to such utility or railroad by reason of the ownership by it of one or more parcels of land and its use as a continuous right of way for transportation purposes, or for other purpose, such additional value shall be separately and specifically set forth for each parcel.

D. The cost of new production as of a date certain, of all physical property other than land, owned and used by such public utility or railroad, showing the values of the separate items comprising such property, together with the unit basis of such valuation.

E. Depreciation, if any, from the new reproductive cost as of a date certain, for existing mechanical deterioration, for age, for obsolescence, for lack of utility or for any other cause, the percentage and amount of each class of depreciation, if any, to be specifically set forth in detail.

F. The net value as of a date certain, of all physical property other than land owned by such utility or railroad, to be derived by deducting the sum of the amounts of depreciation from the sum of the new reproductive costs.

G. If there shall be any additional value given to the value of the property of a public utility or railroad due to the possession of a franchise to perform a public service, or for good will or for financing, such additional value shall be separately and specifically set forth, together with the basis for the computation or estimate of such additional value.

H. A duplicate copy of the record of every physical valuation of a public utility or railroad shall be furnished to the Ohio tax commission, on request, for its use in ascertaining the value of the property of such utility or railroad for purposes of taxation, and upon demand any person or corporation owning or operating a public utility or railroad shall be furnished with a copy of the valuation of his or its property.

Such investigations and report shall show separately the property used and useful to such utility or railroad in the furnishing of the service to the public, and the property held by such utility or railroad for other purposes, and such other items concerning values and methods of making valuations as the commission may deem proper; which said inventories and reports shall be filed in the office of the commission for the information of the governor and the general assembly.

Section 499-10.

Such investigation and report shall also show whenever the commission may deem necessary, the amounts and dates and rates of interest of all bonds, outstanding against each public utility or railroad, the property upon which they are a lien, the amounts paid therefor; and, in such detail as may be necessary, the original capital stock and the moneys received by any such utility or railroad by reason of any issue of stock, bonds or other securities. Such report shall also show the net and gross receipts of such utility or railroad and the method by which moneys were expended or paid out and the purpose of such payments. The commission shall have the power to prescribe the method of procedure to be followed in making the investigation and valuation and the form in which the results of the ascertainment of the value of each utility or railroad shall be submitted, and the classifications of the elements that constitute the ascertained value. Such investigation shall also show the value of the property of every public utility or railroad as a whole; and, in case such utility or railroad has property in more than one county, the value of its property in each of such counties.

Section 499-11.

The Commission during the making of the valuation herein provided for, and after the completion thereof, shall thereafter in like manner keep itself informed through its engineers, experts and other assistants of all extensions and improvements or other changes in the condition and value of the property of all public utilities or railroads and shall ascertain the value of such extensions, improvements and changes and shall from time to time, as may be required for the proper regulation of such public utilities or railroads, revise and correct its valuations of property,

showing such revisions and corrections as a whole and as to each county in the state. Such revisions and corrections shall be filed in the same manner as is provided for original reports.

Section 499-12.

The commission, whenever it shall have completed the valuation of the property of any public utility or railroad and before such valuation shall have become final, shall give notice by registered letter to such public utility or railroad, or if the whole or the major portion of said utility or railroad is situated in any municipality, then to the mayor of such municipality, stating the valuations placed upon the several kinds and classes of property of such public utility or railroad and upon the property as a whole. If within thirty days after such notification no protest shall have been filed with the commission then said valuation shall be and become final. If notice of protest shall have been filed, however, by any public utility or railroad, the commission shall fix a time for hearing the same and shall consider at such hearing any matter material thereto presented by such public utility or railroad or municipality, in support of its protest or by any representative of the public against such protest. If after the hearing of any protest of any valuation so fixed, the commission shall be of the opinion that its inventory is incomplete or inaccurate or that its valuation is incorrect it shall make such changes as may be necessary and shall issue an order making such corrected valuations final. A final valuation by the commission and all classifications made for the ascertainment of such valuations shall be public and shall be prima facie evidence relative to the value of the property.

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IN THE

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1936.

No. 539

THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

THE PUBLIC UTILITIES COMMISSION OF OHIO,
Appellee.

APPEAL FROM THE SUPREME COURT OF OHIO.

APPELLANT'S REPLY BRIEF.

KARL E. BURR,
W. H. THOMPSON,
W. B. STEWART,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Counsel for Appellant.

CHARLES M. BRACELEN,
Of Counsel.

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APPEAL FROM THE SUPREME COURT OF OHIO.

APPELLANT'S REPLY BRIEF.

I. PRICE TRENDS.

Appellee does not deny that in developing its price trends the Commission used (a) prices for telephone equipment furnished by manufacturers other than Western, (b) land values taken from tax rolls, (c) building cost indices taken from the Engineering News Record, (d) labor trends developed from the same source, (e) "information that the

Commission as a regulatory body must be conceded to have available" (Appellee's brief, p. 60). Neither is it denied that this information was withheld from appellant, that it was not offered in evidence, that the right to cross examine and rebut with respect to it was refused, nor that the weighting given to the various items, including the prices of Western Electric Company, was not disclosed. There was consequently a denial of due process. *Morgan* v. *United States*, 298 U. S. 468, 80 L. ed. 1288; *Crowell* v. *Benson*, 285 U. S. 22, 76 L. ed. 598.

It is claimed, first, that the Commission had the right to notice judicially the existence of the depression and to measure the changes in property values resulting therefrom by the use of information not introduced in evidence and withheld from appellant. This subject has already been considered in appellant's opening brief (pp. 31-2), and needs no further discussion here. *

Appellee's principal claim is that the Commission based its findings of value "largely • • • upon the prices of Western Electric which have not declined to the extent of general commodity prices" (Appellee's brief, p. 59); that the values found by the statutory court in the *Illinois Bell* case (*Illinois Bell Telephone Co.* v. *Gilbert*, 3 F. Supp. 595) were arrived at by a similar use of trends based on Western prices only (Appellee's brief, p. 61); and that appellant cannot complain because "It has been demonstrated that the price levels applied by the commission to the property of appellant were considerably higher than the price levels applied by the Statutory Court in the Gilbert case". (Appellee's brief, p. 70). If it be true, as claimed, that the trends represented telephone construction costs, fairly weighted, and were favorable to appellant, it would have

* The depression did not commence until October, 1929, and even this attempted justification, if otherwise valid, would not have authorized the valuation of appellant's property on the basis of judicial notice for 1926, 1927, 1928 or 1929.

been a simple matter for the Commision to disclose the information on which they were based and the manner of application thereof.

The attempted justification of the trends based on the assertion that the Commission "largely" used Western's prices is in itself a confession that the weighting given to them was not disclosed to appellant. Even appellee's counsel does not claim to know.

Thus the facts relative to the secret character of the information used to value appellant's property for 1926 to 1932, inclusive, as stated in appellant's opening brief, remain unchallenged.

Whether in fact the Commission used Western's prices "largely," or what weight it gave to them, is unknown to appellant. Appellant was deprived of its right to test the accuracy of the Commission's statement that it did use them. But if the Commission's statement is correct and imports that principal weight was given to Western's prices, then they were given weight in relation to a large portion of appellant's property to which they have no application, being applicable, as they are, to less than 30 per cent of appellant's plant.

Appellee sets out at pages 62 and 63 of its brief what purports to be a Western Electric price trend and a comparison of price trends "adopted by Statutory Court in Chicago Case and those adopted by Ohio Commission". This trend is based upon Exhibit X 13A (R. 8966), which merely shows the changes in the prices of *telephone apparatus and equipment* sold to all Bell Associate Companies. Only 55.9 per cent of Western's total sales to appellant from 1916 to 1930 consisted of telephone apparatus and equipment to which these reductions are applicable (Ex. A, 88 B, R. 8759). As the material cost is, on the average, about one-half the total cost of the plant, varying of course with the various classes of plant (R. 2290; 2304; 1086), the percentage of Western Electric telephone apparatus and equip-

ment in appellant's plant is only about 28 per cent of the total. This is further shown by the fact that in the Ohio Commission's value for June 30, 1925 (Appendix to appellant's brief, page vii), out of a total reproduction cost of $108,000,000, central office telephone equipment and station equipment aggregate less than $30,000,000. These are the only two accounts in which there will be found any substantial amount of telephone apparatus or equipment manufactured by Western. Thus the prices of Western which appellee's counsel claim were "largely" considered by the Commission in its trends, are applicable to less than 30 per cent of the entire plant.

The 70 per cent of the plant to which Western's said prices can have no application consists in part of land; buildings; lead-covered cable; copper wire; supplies, poles, and other items as to which Western is a more purchasing agent; and all labor costs.*

The intimation that a correct result has been reached and that appellant therefore cannot complain of the illegal method used is of course wholly beside the point and must fail. The correctness of the result was the very question to be tried out before the Commission and the failure to disclose the price trend information prevented any contest. Appellant was denied its right to have its case determined "with suitable opportunity through evidence and argument * * * to challenge the result". *West Ohio Gas Co.* v. *Public Utilities Commission of Ohio* (*No.* 1), 294 U. S. 63, 79 L. ed. 761). Under these circumstances appellee cannot be heard to say that perhaps appellant has not been harmed. How-

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* The prices shown in Ex. X 13 A relate to those articles of Western manufacture as to which manufacturing cost is the controlling factor, and as to which Western was enabled to make the reductions shown because of efficiency in operation and volume of business. They do not reflect the prices of lead-covered cable and copper wire, prices of which are largely controlled by the metal market, nor do they reflect the prices of items manufactured by others, though sold by Western (R. 3878; 3887-8).

ever, since the attempt is made, appellee's contentions will be considered seriatim.

Appellee's contention that the Statutory Court in the *Illinois* case in arriving at fair value considered only the prices of Western is incorrect. Neither the Company, State, nor the Statutory Court developed any Western Electric price trends or sought to apply such trends to the entire Chicago property. There, each class of property was converted from the price level of one year to that of the succeeding year by the use of labor and material cost factors, based on evidence of the changes of value in that particular class of property.

The further effort to show that the Commission reached a right result by comparing the book cost of the property less the depreciation reserve with the Commission's findings of value must fail because condemned by this Court in *West* v. *Chesapeake & Potomac Telephone Co.*, 295 U. S. 662, 79 L. ed. 1640, where this Court said at page 679, "This rough and ready approximation of value is as arbitrary as that of the Commission • • •".

Appellee's statement (Brief, p. 70) that "the price levels applied by the Commission to the property of appellant were considerably higher than the price levels applied by the Statutory Court in the Gilbert case • • •" is not correct. In the Illinois case, the value fixed for 1925 was $31,000,000 *in excess* of undepreciated book cost, as compared with a finding here of $5,000,000 *below* such cost. Not until 1931 was the value found in the Illinois case less than such cost; and the finding for 1932, of $5,000,000 below such cost, compares with a finding in the instant case, for that year, of $30,000,000 below such cost. (Table, p. 15, Appellant's opening brief).

The record, in fact, clearly shows that by its method the Commission reached a wrong result and under valued appellant's property. Findings of value ranging from

$5,000,000 below undepreciated book cost in 1925 to $30,000,000 below such cost in 1932 and $35,000,000 below such cost in 1933, (Table, p. 15, Appellant's opening brief), and less than depreciated book cost by $11,000,000 in 1932 and $15,000,000 in 1933 (Appellee's brief, p. 53) do not reflect current values. This is particularly true in the light of the evidence of Commission's witness Hagenah (R. 2117) that from 1913 to 1925 telephone construction costs in Ohio had increased from 55 to 60 per cent, most of the increase having occurred between 1916 and 1925; and that from 1921 to 1925 the average cost of plant per telephone in Ohio increased from $173 to $200.51, or an increase of 16 per cent during that period (R. 2116). Of the plant in place on June 30, 1925, $55,000,000 had been installed prior to September 20, 1921 (Wood Ex. 2, R. 8172), and much of it earlier.

The fact remains unchallenged that appellant has been required to refund more than $10,000,000 without seeing the evidence upon which the refunds were based. It is no answer that they are claimed to have been based on values determined by trends founded "largely" upon prices with which appellant was familiar. If they were based "largely" on Western's prices this but emphasizes the fact that thereby appellant's constitutional rights have been invaded, first, because Western's prices apply only to a portion of appellant's plant, and, second, because appellant was entitled to know the extent to which these prices influenced the final result. Similarly it is no answer that a correct result may perhaps have been reached, particularly in view of a record which so plainly shows that the final values reached are at wide variance with actual value. Appellant had the right to have the case determined on the basis of evidence disclosed to appellant and to challenge the results through evidence and argument.

"Convenience" No Justification for Use of Undisclosed Price Trend Information.

Appellee argues that it was impracticable for the Commission to make a company wide valuation of appellant's property for each year subsequent to 1925, and that therefore the Commission was entitled, as a matter of convenience, to use the price trend method in arriving at its findings of value for each of the years 1926 to 1933, inclusive.

This argument is based upon an entire misconception of appellant's complaint against the use of the price trend information.

Appellant's position is not that price trends, when based upon telephone material and labor costs, are not evidence of value, or that the Commission might not properly have considered price trends in arriving at values. What appellant complains of is that the price trends were used, first, as a formula and not merely as evidence of value, and, second, that the trends were based upon evidence withheld from appellant and which it was given no opportunity to examine, explain or rebut.

Surely "convenience" cannot justify the determination of a case by an arbitrary method and upon secret evidence.

The proceedings before the Commission were two-fold in character. In the *Pence* law cases appellant's obligation was to refund such portion of the bonded rate increases as the Commission should thereafter determine to be excessive. In those cases the burden of sustaining the increases clearly rested upon appellant. There is no claim that appellant did not repeatedly demand the right to discharge this burden. Indeed, the Commission concedes and the record shows that throughout the hearings appellant insisted upon the right to make this proof (R. 190).

The company wide case, on the other hand, was commenced upon the Commission's own motion and, in addition

to determining the issues with respect to Western Electric prices, license contract payments and other issues common to all of the *Pence* law cases, had for its purpose—its only purpose—the fixing of appellant's rates for the future. It was authorized by Section 614-23 of the Ohio General Code (Appellant's opening brief, Appendix p. iv), which confers upon the Commission authority to make such investigations on its own motion and fix rates for the future only after findings made. In that case (the company wide) no burden rested upon appellant to prove that its rates were just and reasonable.

Interstate Commerce Commission v. *Louisville & Nashville R. Co.*, 227 U. S. 88, 57 L. ed. 431;

State Corporation Commission of Kansas v. *Wichita Gas Co.*, 290 U. S. 561, 78 L. ed. 500.

But in any event, inasmuch as the Commission concluded only one aspect of the two-fold investigation by ordering refunds in the *Pence* law cases, and left undecided the other question, viz., that of appellant's reasonable rates for the future, the case, as determined, resolved itself into a *Pence* law case only—as to which appellant repeatedly offered to sustain the burden of proof. Having done so, it could not be prejudiced by any claimed failure to offer proof bearing upon an issue which was never decided, viz., the issue of its rates, company wide, for the future.

The record shows, however, that appellant fully cooperated with the Commission in its company wide inquiry. It furnished a detailed inventory and appraisal of its property as of June 30, 1925, and, at the Commission's request, furnished statements showing its gross and net additions by semi-annual periods thereafter. The matter of its rates for the future being still undecided by the order of January 16, 1934, appellant, notwithstanding it was under no duty to do

so, offered to make proof of the fair value of its entire intrastate property, toll and exchange, as of that year (R. 313). This offer the Commission also rejected.

In this case, the Commission, having embarked on a company wide investigation which had for its purpose the fixing of appellant's rates for the future, and having concluded that no reduction could be ordered, abandoned the company wide inquiry and attempted to relate to the *Peuce* law cases the results of its investigation in that inquiry. Its over-all values, found for the purpose of that inquiry, were arrived at by the application of the price trend percentages heretofore discussed. Admittedly there was no evidence in the record out of which such trends could have been constructed. Admittedly they were based upon evidence outside the record. Asked to disclose the information out of which the trends had been constructed, the Commission declined to permit appellant to so much as examine it, much less explain and rebut the information. How, as the result of withholding the information, can the Commission expect to avoid the implication that the information used could not stand the test of reasonable examination?

Appellee's counsel intimate that appellant's insistence upon its right to introduce evidence of the reasonableness of its rates in the bond cases came late and is invalidated because of an acquiescence in the company wide inquiry. Acquiescence in the company wide inquiry was in no sense inconsistent with the right to proceed to prove the bonded rates reasonable, but, additionally, the fact is that that right was reserved to appellant in the order instituting the company wide case and consolidating the then pending cases therewith. (R. 714.) It is further admitted in unmistakable terms by the Commission in its findings of January 16, 1934, that the company has at all times insisted upon that right (R. 190).

In 1929, in open hearing, the Commission, appellant and counsel for the State reached a definite agreement that by proceeding with the company wide case appellant was waiving none of its rights to make proof with respect to the reasonableness of its *Pence* law rates. Appellant offered to make that proof either during the progress of and as a part of the company wide investigation or at the conclusion of that case, as the Commission might desire (R. 2944-52).

II. DISALLOWANCE OF EXPENSES.

(1) Expense of Depreciation.

Appellee does not deny that the Commission's allowance for the expense of depreciation for 1925 to 1933, inclusive was $8,067,266 less than appellant's actual cost of intrastate plant retirements for that period. Appellee seeks to justify the allowances upon the four grounds urged in the Supreme Court of Ohio and set forth at page 43 of appellant's opening brief.

(a) With respect to the claim that appellant's retirement experience for the years 1925 to 1933, inclusive, was abnormal, the additional argument is now made that all or some part of that abnormality was due to the unprecedented growth of appellant's plant, beginning in 1925. Obviously appellee cannot rest solely upon the claim that there was duplicate or parallel property requiring removal, in view of the fact that its witness Hagenah testified in 1926 that there was no substantial amount of duplicate non-useful plant (Appellant's opening brief, p. 44), and the further fact that the Commission in its findings of January 16, 1934, reduced the rate base as of June 30, 1925, by $3,000,000 on account of progressive obsolescence, lack of utility, and *parallel plant facilities,* thereby limiting the amount of parallel facilities to a maximum of $3,000,000 (R. 161).

The Commission in this connection said (R. 162):

> "we should consider that the property of the Company * * * was undergoing a pronounced change in that in many cities it was the result of the combination of two companies with duplicated property. It is true that it is claimed that the combination had been completed and the property had for some time been in operation as a single unit, but it also appears from the evidence that there was a continual change going on which required the elimination of many kinds of property which still had useful life, due to the progress of the art and due also to the ever-present pressure of municipalities to rid their streets of overhead wires and poles. * * *
>
> "These matters in our judgment, point to the fact that there was a solid basis for the former judgment of the Commission, that the element of progressive obsolescence was constantly at work to lessen the value of all depreciable property beyond the one element of observed physical depreciation due to wear and tear or use and exposure as denominated by Mr. Sloan. We, therefore, feel that we must adhere to the former judgment of the Commission."

Thus the Commission has found that as a result of the unification some amount, less than $3,000,000, was represented by parallel plant facilities still in use on the day certain, and has excluded that property from the rate base. It now seeks to justify its refusal to allow appellant to reimburse itself for $8,000,000 of retirement cost on the ground that retirements were abnormal because of duplicate plant. If the Commission's annual rates of depreciation are to be sustained, the result is not only that appellant is denied the right to earn a return upon the $3,000,000 of excluded property but is also refused the right to reimburse itself for the loss incident to the retirement of that property by charges to the depreciation reserve, and additionally is required to absorb without re-

imbursement more than $5,000,000 of retirements of other property (*Cf. Pacific Gas Co. v. San Francisco*, 265 U. S. 403, 68 L. ed. 1075).

The claim that the retirements during the period in controversy were abnormal because of unprecedented growth and that therefore the Commission's rates are to be upheld is without merit. During a period of rapid growth, retirements due largely to the factor of inadequacy will be larger and more rapid than during periods of ordinary business conditions. But such necessarily larger and more rapid retirements are in no sense "abnormal."

During the period 1925 to 1930 public interest demanded that appellant construct plant to the extent required by the then current conditions. During this period the number of appellant's telephones increased by more than 40 per cent, requiring an additional investment in plant of almost $65,000,000 (R. 191; 8361). Manifestly, retirements due to inadequacy increased rapidly. No reason has been nor can be advanced why the rate-payer should not under such circumstances pay a rate sufficient to enable the company to meet its expenses, including proper expense of depreciation, and earn a fair rate of return, just as he must under ordinary business conditions.

Appellee's claim is, in short, that appellant, although required to expand its plant because of the business conditions of 1925 to 1930, is to be denied reimbursement for retirements necessarily consequent thereupon. Followed to its logical conclusion it would mean that during periods of great prosperity confiscation is permissible.

(b) While it is still claimed that the Commission gave actual consideration to appellant's retirement experience during the period 1925 to 1933, if this be so, it was forthwith rejected.

(c) With reference to the claim that appellant's depreciation reserves were inadequate, appellee approaches the question as if the Commission had found them so to be. In fact, the Commission made no such finding and there was no evidence in the record upon which such a finding could be based.*

By calculations not based upon any finding of the Commission and not in the record, appellee in its brief (pp. 102, 103) attempts to show what appellant's depreciation reserve should have been at its organization in 1921 and at the end of the period in controversy, November 30, 1933. The unsoundness of the entire argument, based upon the alleged inadequacy of depreciation reserve, is demonstrated by the fact that appellee claims that at its organization in 1921 appellant's reserve to take care of the ultimate retirement of $75,000,000 of plant should have been $14,638,670; and similarly contends that at the end of the period, 1933, appellant's reserve to take care of the ultimate retirement of $166,000,000, or twice as much of plant, should have been $14,652,468. The argument is its own refutation.

The entire argument is an afterthought of Commission's counsel. It was first advanced in the Supreme Court of Ohio. It was not made to the Commission and the Commission neither considered the question of the adequacy of reserves nor based its allowances thereupon. In point of fact the calculations now presented at pages 90, 97, 102, 103 and 104 are not, nor are they based, on any findings of the Commission. They are not in the record. They are merely calculations prepared by counsel in an effort to support the

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* Appellee admits (appellee's brief, pp. 79, 99, 106) that substantial telephone properties were taken over by appellant and recorded upon its books at depreciated value. Obviously as to these, there was no necessity for an initial reserve.

Commission's finding which was distinctly based upon another ground. Nor is it true that the Commission made any finding that appellant's annual rates of depreciation for the period 1921 to 1925 were excessive. Nor did the Commission determine the per cent condition of the property at September 20, 1921, or at any time other than June 30, 1925. The table at page 90 of Appellee's brief is not the work of the Commission nor of any witness, nor is it in the record.

The incontrovertible fact is that the Commission arrived at its allowance solely by determining the percentage of retirement cost to book cost for the period, 1921 to 1925, which it found to average annually 3.74 per cent (R. 201). This the Commission claimed to have rounded out to 4 per cent, but, as shown in appellant's opening brief (pp. 38-9) this was not in fact done. Appellant's depreciation rates should not be fixed upon the basis of a claim never presented to or considered by the Commission. *Cf. West Ohio Gas Co.* v. *Public Utilities Commission of Ohio* (No. 1), 294 U. S. 63; 79 L. ed. 761.

(d) The record shows without contradiction that the voluntary reduction of appellant's annual rates of depreciation in 1932 was due to the fact that in 1931 it had been demonstrated for the first time that appellant's growth had been temporarily arrested, as a result of which, inadequacy as a factor in determining service life had become temporarily less important (R. 3640-2; *cf.* table p. 40, appellant's opening brief). The evidence cannot be overridden by assertions of appellee's counsel.

It is submitted that the attempt to support the Commission's allowances for the annual expense of depreciation must fail. There can be no validity in an order requiring appellant to absorbe without reimbursement more than $8,000,000 of retirement losses which are known to have occurred during the period in controversy. Appellant was entitled to

an allowance for the expense of depreciation not only sufficient to parmit it to absorb these retirement losses but additionally, in view of the character of its plant and the growth which it was experiencing, to provide something additional for the ultimate retirement of its still existing plant.

(2) License Contract Costs Disallowed.

The Commission's disallowance of appellant's license contract payments is sought to be sustained almost entirely by the assertion that the Commission had the right to exercise its judgment as to whether appellant was justified in incurring the expense.

Without undertaking to discuss again the specific disallowances complained of in appellant's opening brief, appellant points out that with respect to such major disallowances as the costs incurred in the development of vacuum tubes and wireless telephony, the factual evidence altogether removes these costs from the field of judgment. This is because the uncontradicted evidence shows that the work of the department was all undertaken in direct relation to the art of telephony and has resulted in the improved vacuum tubes and the other instrumentalities set forth at page 54 of appellant's opening brief (R. 4127-9; 4139-46).

Vacuum tubes are in large use in appellant's property and have increased rapidly in number and importance of function since 1925 (R. 4134-5). All of the instrumentalities are in constant use in all parts of the Bell system (R. 4128; 4143).

There was no greater justification for the Commission's other disallowances. Administrative "judgment" cannot override undisputed proof that the license contract services were needed and used by appellant and that the payments therefor did not exceed the cost.

Neither can the Commission's disallowances be justified on the ground suggested in Appellee's brief (p. 111) that the license contract payments have been voluntarily reduced since 1928. As pointed out in appellant's opening brief (p. 51), prior to 1928 the services included the furnishing to appellant of all telephone instruments. See also *Smith* v. *Illinois Bell Telephone Co.*, 282 U. S. 133 at p. 156, 75 L. ed. 255.

III. REFUNDS ARBITRARILY ORDERED.

That the Commission fixed the amount of the refunds wholly upon the basis of gross exchange revenues; that, although ordering both toll and exchange refunds, it wholly excluded toll revenues from all consideration; and that it treated, as bonded, millions of dollars of revenue not in fact bonded, is not denied. That being so, the Commission's method of determining the amount of the refunds must necessarily fall because it bore no relation to the end sought, which was to determine how much of the total excess earnings was represented by increases in rates collected under bond. See *Dayton Power & Light Co.* v. *Public Utilities Commission of Ohio*, 292 U. S. 290, 294, 78 L. ed. 1267.

In the *Minnesota Rate Cases*, 230 U. S. 352, 57 L. ed. 1511; *Wood* v. *Vandalia R. Co.*, 231 U. S. 1, 58 L. ed. 97; *Chicago, M. & St. P. Ry. Co.* v. *Tompkins*, 176 U. S. 167, 44 L. ed. 417, comparable methods were held to result in a denial of due process.

Entirely apart from the fact that refunds could not have been arrived at by an apportionment based on gross revenues, the fact that the amount ordered refunded to toll patrons was admittedly nothing more than an accidental residue or a "left-over" (R. 3757) is sufficient to condemn the method here used.

Table of Refunds by Years.

The method by which the Commission arrived at the refunds for the several years is described at page 63 *et seq.* of appellant's opening brief.

In order, however, to show the application of the method by years, the following table has been compiled:

Year	Total gross exchange revenues (all exchanges, bond and non-bond), used as the starting point of the Commission's method (1)	Exchange revenues (including Cleveland), counted by the Commission's method as bonded (2)	Percent relation of (2) to (1) (3)
1925	$24,554,400.	$18,449,365.	75.136698%
1926	26,628,407.	23,663,276.	88.864784%
1927	28,617,757.	26,273,242.	91.807481%
1928	30,447,906.	28,027,277.	92.049931%
1929	33,431,682.	30,719,328.	91.886878%
1930	34,422,892.	31,539,782.	91.624441%
1931	33,722,537.	30,870,850.	91.543676%
1932	30,038,321.	27,478,059.	91.476682%

Year	Total excess earnings found for the year (4)	Excess earnings attributable to bonded cases found by the Commission (3) x (4) (5)	Increases collected under bond (Exchange) (6)
1925	$1,822,647.	$1,369,477.	$1,137,195.
1926	2,041,483.	1,814,159.	1,637,314.
1927	1,986,610.	1,823,857.	1,907,983.
1928	1,925,301.	1,772,238.	2,002,061.
1929	1,463,347.	1,344,624.	2,145,355.
1930	1,481,689.	1,357,589.	2,185,156.
1931	1,659,760.	1,519,405.	2,079,578.
1932	908,335.	830,915.	1,793,032.

Year	Amount ordered refunded (Exchange) (7)	Amount ordered refunded (Toll) (8)
1925	$1,137,195.	$232,282.
1926	1,637,314.	176,845.
1927	1,823,857.	Nothing
1928	1,772,238.	"
1929	1,344,624.	"
1930	1,357,589.	"
1931	1,519,405.	"
1932	830,915.	"
Total	$11,423,137.	$409,127.

Using the year 1925 for example, the table shows that for that year the total revenues of $18,449,365 from the bond exchanges amounted to 75.13 per cent of the total gross revenues of $24,554,400 from all exchanges, bond and non-bond.

That per cent was applied to the total excess earnings of $1,822,647 found by the Commission for that year, and gave $1,369,477 as the portion of the total excess earnings represented by bonded increases collected in that year. Inasmuch, however, as only $1,137,195 was collected under bond in the exchanges during that year, the balance ($232,282) not absorbable by way of exchange refunds, was arbitrarily assigned to toll.

The same process was followed for each of the other years and resulted, as stated, in the ordering of refunds in the total sum of $11,832,264 for the entire period.

Cleveland Illustration.

Appellee does not deny that by counting all of the Cleveland exchange revenues ($103,677,597) as bonded, the Commission increased the refunds by some $4,800,000 more than if only the $838,000 of actual bonded increases had been counted as bonded. It asks, however, what would have been the result had there been eliminated from the calculation "all non-bonded revenues in all protesting exchanges"? The Cleveland situation was used only by way of illustration because it reflects by far the major part of this particular error in the Commission's method. If there be eliminated from the Commission's apportionment calculation all non-bonded revenue of all protesting exchanges instead of only Cleveland's non-bonded revenue, the Commission's error, illustrated by the Cleveland situation, would obviously have been *increased*—this for the reason that each dollar eliminated from the bonded side of the Commission's calculation would have decreased the per

cent of bonded revenues to gross revenues and, correspondingly, the per cent of the total excess earnings ordered refunded for each year.

Appellant does not at all intend to convey the impression that, as the result of the Commission's method, the $4,800,000 of refunds were ordered repaid to Cleveland subscribers. (In fact only $645,000 was ordered refunded in Cleveland, notwithstanding more than $5,500,000 of refundable excess was attributed to that exchange by the Commission's method.) What appellant asserts is that by counting all of the Cleveland exchange revenue as bonded, the *total* bonded revenue ordered to be refunded was increased by that amount, and that the per cent of the total excess ordered to be repaid to the subscribers was increased proportionately.

IV. VALUATION.

(1) In General.

That appellant's property was substantially undervalued is demonstrated by the discussion relating to the Commission's use of price trends at pages 1 to 10, *supra*.

(2) Omitted Land.

Appellee seeks to justify the Commission's action in excluding from the rate base as of June 30, 1925, parcels of useful real estate purchased for central office purposes, for the following reasons.

(a) Under the Ohio statute the Commission was required to include only used and useful property and "that lands purchased for future use must be excluded" (Appellee's brief, p. 29). This contention is answered in appellant's opening brief (p. 76).

In the case of *Indianapolis Water Co.* v. *McCart et al.*, decided March 23, 1937 (since the filing of appellant's opening brief), the United States Circuit Court of Appeals for the Seventh Circuit has held that the District Court erred in excluding from the rate base property of appellant known as the "Oaklandon lands", saying:

> "It was the purpose at the time of the purchase (of the land) to construct a dam near the lower boundary line of such tract and retard the flow of water in Fall Creek and thus build a large reservoir. Appellant's engineer testified that preliminary studies had been made with respect to the proposed dam and reservoir and detailed plans completed. It seems that the advent of the depression retarded the consumption of water and this factor and others caused a slowing of the project. An examination of the evidence on this subject offers no justification for an assumption that the project has been abandoned. On the other hand it requires a finding that the property was providently purchased and in good faith and is reasonably useful for appellant's business. Under such circumstances it should have been included in the rate base."

(b) Williams and Sloan for appellant and Hagenah and Allensworth for the state all appraised the total land at the value of $3,943,467, whereas the total cost of the land as shown by appellant's books, including the excluded parcels, was only $2,693,406 (Appellee's brief, p. 29); and it is suggested rather than argued that the Commission was justified in excluding this land, because the value established by this uncontradicted evidence was in excess of book cost.

As a matter of fact the appraisals of appellant's real estate were made in almost every instance by members of local real estate boards. The appraisals were accepted by appellant's engineers and the engineers for the state (R.

130-1). In speaking of Hagenah's acceptance of these valuations, the Commission, in its tentative finding, said:

> "State's witness, Hagenah, addressed a circular letter to the City Attorneys of all the large Cities of Ohio, including every community with a population of over 25,000, asking for a report on the valuation made by the company and the standing of real estate brokers, whose judgment was the basis of the company's valuation. In practically every instance the brokers were found to be men of high standing and of good repute in their communities and the values were determined to be substantially correct and were acceptable to the cities' attorneys in the case. As a result of that investigation, witness, Hagenah, accepted the figures of the company on land value." (R. 130-1).

The Commission acted upon this undisputed evidence and accepted the values so found for all the parcels of land included in the rate base. Its rejection of the excluded parcels was solely because they were not in actual use on the date certain. Its action in this respect was in direct violation of the rule laid down in the case above cited and in those cited in appellant's opening brief, p. 75.

The table which appears as Appendix C (R. 233) to the Commission's order of January 16, 1934, and is attached hereto as Appendix C. p. vii, shows for each of the excluded parcels, the period elapsing after June 30, 1925, for which each parcel of land was excluded from the rate base.

(3) Going Value.

Appellee makes the statement that all of the items included in the "cost of establishing business," as testified to by appellant's witnesses, were in the nature of operating expenses and that, had they been actually incurred by ap-

pellant, they would have been so charged upon its books.

It is true that many of the items going to make up the cost of establishing business are of the same character as expense items and that payments therefor, if made by a company whose business already had been established, would be charged to operating expenses. Appellee, however, overlooks the fact that in arriving at the reproduction cost new of a property, these outlays are made at a time prior to the establishment of business and prior to the receipt of revenues out of which expenses can be paid. They are thus capital outlays.

This is perfectly clear from the record. The evidence distinctly shows that in arriving at the cost of establishing business the witnesses who testified were careful to exclude such costs as followed the establishment of the business and the receipt of revenues (R. 1333; 1339-48; 1350-3; 1356-7; 1360-1; 1364-6; 1759-60; 1763-70; 1772).

Thus the Commission said, in its finding of tentative value:

> "This per cent will cover those expenses necessarily incurred in the interim between the completion of the physical plant and the final attaching of its subscribers." (R. 138.)

Additionally, it is not denied that no provision for going value was made by any witness in his unit costs; that the Commission so recognized and in its tentative valuation made an allowance for going value of $3,592,040, based wholly on the evidence; that it has never retracted its finding; and that instead it has merely eliminated the item as a separate item from its final value, claiming that somewhere in the final value the allowance still exists. This, as shown in appellant's opening brief at page 77 and following, is a mathematical impossibility. Surely, under the circumstances of this case, it cannot be claimed that a rate base

$5,000,000 below the actual cost of the property is large enough to include any allowance for going value.

V. APPELLANT'S FINANCIAL EXPERIENCE.

At page 23 and 140 of appellee's brief the statement is made that upon the basis of the Commission's findings appellant's surplus at November 30, 1933, after making the refunds which have been ordered, would be $10,682,929, and its reserve for depreciation would be $14,652,468. This statement of course is based on the assumption that the Commission's findings and orders are correct in every respect. Additionally, appellee in reaching the result stated above has made an error to the prejudice of appellant in the sum of $9,201,120, as shown in the calculation and explanation attached hereto as Appendix A, p. i.

The miscalculation comes about in the main from the assumption of appellee's Counsel that appellant's original reserve when it commenced business in 1921 could have been increased by over $8,000,000 (the claimed inadequacy therein) without a corresponding reduction in surplus.

VI. COMMISSION'S RATE REDUCTION ORDER OF JANUARY 29, 1937.

Appellee directs attention to a fact not appearing in the record and not considered by the Supreme Court of Ohio, that on January 29, 1937, nearly three years after the orders here complained of, the Commission ordered a rate reduction of approximately $1,900,000, in which appellant has acquiesced.

Appellant is not now raising any question with respect to the Commission's refusal to fix rates for 1933 and thereafter. This order therefore has no bearing upon this case or any issue therein.

The Court's attention has been directed to the amount of the reduction, but not to the fact that in that order the

Commission (a) reaffirmed its earlier finding that appellant's rates in 1933, including those increased under bond, were not excessive; (b) found that the same rates for 1934, 1935, 1936, and the first three months of 1937 were not excessive; and (c) announced as a reason for the reduction that "the prospect of improving business conditions and of continuously improving efficiency in said company's operations will afford said company a reasonable opportunity to earn a fair return under reduced schedules for its service". A copy of that order, omitting only the rate schedules and the detailed discussion of the new rates, is printed as Appendix B hereto, p. iii.

Respectfully submitted,

KARL E. BURR,
W. H. THOMPSON,
W. B. STEWART,
ASHLEY M. VAN DUZER,
THOMAS V. KOYKKA,
Counsel for Appellant.

CHARLES M. BRACELEN,
Of Counsel.

April 3, 1937.

APPENDIX A.

Error in Calculations on Pages 23 and 140, Appellee's Brief.

The calculations on pages 23 and 140 of appellee's brief assume that appellant's reserves in 1921 were inadequate by $8,419,041 (Appellee's brief, p. 102); and by $300,251 and $1,200,628 by reason of appellant's failure to set up adequate reserves to care for properties purchased subsequent to 1921 (Appellee's brief, pp. 102-3). These sums aggregate $9,919,920. This figure, adjusted by deducting $718,800—the difference between the disallowed depreciation for the entire company through 1933 (Appellee's brief, p. 102) and the disallowed depreciation and amortization expenses, intra state through 1932 only (Appellee's brief, pp. 141-2), becomes $9,201,120, the exact amount of the miscalculations above referred to. The fallacy in appellee's calculations is that in order to create the reserves, which it is claimed appellant should have had, it would have been necessary to secure the money from surplus.

Stated another way, appellant's book surplus at the end of the period, November 30, 1933, was $2,813,345. Its reserve was $21,999,901 or a total of $24,813,246. By restoring, as appellee has done, $2,870,218 of license contract expenses disallowed and $283,077 of Western Electric purchases attributable to the 10.2 per cent increase of 1930 and charged to expense, the figure of $27,966,541 is reached.

But in order to possess the reserve and surplus which appellee claims appellant would have at the end of the period, before making the refunds, it is essential that appellant have a reserve of $14,652,468 and a surplus of $22,515,193 (being the claimed surplus of $10,682,929 plus refunds of $11,832,264) or a grand total of reserve and surplus of $37,167,661. But all that appellant has, even including a restoration of the license contract payments disallowed and the Western Electric purchases charged to expense, is $27,966,541. The difference of $9,201,120 must come either from surplus or reserve and appellee's calculations are fallacious to that extent. This is shown by the table following:

	Depreciation Reserve	Surplus	Total
	1	2	1+2
			3
Books	$21,999,901	$2,813,345	$24,813,246
Disallowed Depreciation	*16,115,738	16,115,738	.....
Disallowed Amortization	*432,815	432,815	.....
Balance	$5,451,348	$19,361,898	$24,813,246
Disallowed Licensee payments	.....	2,870,218	2,870,218
Disallowed Western Electric Co. payments charged to expense	.....	283,077	283,077
Balance	$5,451,348	$22,515,193	$27,966,541
Refunds ordered	.....	*11,832,264	*11,832,264
Balance	$5,451,348	$10,682,929	$16,134,277
Claim of Appellee	14,652,468	10,682,929	25,335,397
Overstatement	$9,201,120	.....	$9,201,120

* Indicates red figure.

APPENDIX B.

Commission's Rate Order of January 29, 1937.

BEFORE THE

PUBLIC UTILITIES COMMISSION OF OHIO

No. 3307.—In re: Investigation and Inquiry of The Public Utilities Commission of Ohio, Upon Its Own Motion, For the Determination (a) of the Fair Value of the Property of The Ohio Bell Telephone Company, Toll and Exchange, (b) of the Just and Reasonable Rates and (c) of Reasonable Rules and Regulations For Services Furnished By Said Company to Its Patrons Throughout the State of Ohio.

FINDING AND ORDER.

The Commission, by its findings of January 16, 1934, in this cause, having found that at its rates, toll and exchange, then in effect The Ohio Bell Telephone Company had had no excess income for the year 1933, and being now of the opinion that the matter of the just and reasonable rates for the service of said company for the period of 1933 and thereafter, as well as for the future, should be disposed of as an entirety, and the public accorded the benefit of a reduction in rates at the earliest date possible, the Commission has, with the concurrence of the Attorney General of Ohio, directed said company to enter into negotiations with the Commission with respect thereto, and said company has accordingly done so.

And the Commission having made such investigation and held such hearings as by it deemed necessary and proper and being duly advised in the premises, finds that since 1932 there has been a marked increase in price levels, including those reflecting telephone property costs; that, according to information available to the Commission, the net earnings of said company upon its investment for the years

1934, 1935 and 1936 were 4.30%, 5.27% and 5.91%, respectively, or an average for the three-year period of 5.16%; that since 1933, the last year covered by said findings of January 16, 1934, there has been an increase of nearly 18% in the wages paid by said company, resulting in a total payroll increase of more than $2,500,000; that there has been an increase of nearly $1,350,000, or more than 32%, in the taxes paid by said company for the year 1936 over those of 1933; that additional taxes already imposed, including Social Security Taxes, will further increase the tax burden of said company for the year 1937 by approximately $500,000; that since 1933 said company has voluntarily made reductions and adjustments in the rates and charges for its services, both exchange and toll, amounting, in the aggregate, to $500,000 per year.

Nevertheless, and notwithstanding the foregoing facts, the Commission is of the opinion that the prospect of improving business conditions and of continuously improving efficiency in said company's operations will afford said company a reasonable opportunity to earn a fair return under reduced schedules for its service.

The Commission, therefore, coming now to consider the amount by which said rates should be reduced in the interest of the public, is of the opinion and hereby further finds after due investigation, that such reductions should be in an amount estimated at approximately $1,912,000 per annum, divided as follows:

SUMMARY OF PROPOSED REDUCTIONS.

	Estimated Per Annum Reduction
1. Adjustment in rates for exchange services amounting to a reduction of	$1,687,000
2. Adjustment in miscellaneous charges amount-to a reduction of	75,000
3. Adjustment in rates for intrastate toll services amounting to a reduction of	150,000
Total Reduction	$1,912,000

• • • • • • •

And the Commission now finding that the rates of said company in effect for the year 1933, heretofore found not to have yielded more than a fair return, are and have continued to be the just and reasonable rates for its services for the period of 1933 and thereafter up to the effective date of such new schedule, it is

ORDERED, as an entirety and not otherwise, as follows:

(1) That, conditioned that no existing rate, charge, rental or toll be thereby increased, said The Ohio Bell Telephone Company be and hereby it is notified and directed to file on or before April 1, 1937, effective April 1, 1937, schedules of rates for its services, toll and exchange, not to exceed those set forth in the new tables of principal rates, hereto attached and hereby made a part hereof by reference, as follows:

Table A—Table of Basic Exchange Rates consisting of 11 sheets numbered 1 to 11 inclusive

Table B—Table of Toll Mileage and Toll Rates consisting of 1 sheet

Table C—Table of Items Related to Exchange Rates consisting of 2 sheets

which rates the Commission hereby finds to be just and reasonable for such services, the rates contained in said new schedules to be charged by said company as the just and reasonable rates for such services from and after April 1, 1937, except that no existing rate, charge, rental or toll shall thereby be increased;

(2) That liability of said company and its sureties for the year 1933 and thereafter, whether upon their several bonds executed and in effect pursuant to Section 614-20 of the General Code of Ohio or otherwise, be and the same hereby is discharged and terminated but not for any of the years 1925 to 1932, inclusive;

(3) That liability for refunds for said years 1925 to 1932 having been fixed by order of the Commission, affirmed by the Supreme Court of Ohio, and now under review on appeal in the Supreme Court of the United States, the liability of said company and its sureties on said bonds for said years shall be in accordance with the final refund order hereto-

fore entered in this cause provided the judgment of the Supreme Court of Ohio approving said order shall be affirmed by said Supreme Court of the United States; otherwise such liability shall be in accordance with the lawful orders of the Commission subsequently made with respect thereto. Nothing herein shall prejudice the rights of either of the parties to said cause or be construed to modify, limit or otherwise affect the liability of said company for refunds for said years 1925 to 1932, inclusive;

(4) That this order shall take effect and become operative this 29th day of January, 1937. It is further ordered that a copy of this order and its accompanying tables and exhibits be forthwith served upon said The Ohio Bell Telephone Company and like copies furnished to The Honorable Herbert S. Duffy, Attorney General of Ohio, and the Mayor of each incorporated municipality in the State of Ohio wherein said company furnishes local exchange service.

The Public Utilities Commission of Ohio,
E. J. Hopple,
Chairman.
Charles F. Schaber,
R. D. Williams,
Commissioners.

[Seal.] Dated at Columbus, Ohio, this 29th day of January, 1937.

A True Copy:

David Shaw Archer,
Assistant Secretary.

* * * * * * *

APPENDIX C TO COMMISSION'S FINDINGS OF JAN. 16, 1934.

The Ohio Bell Telephone Company—Formal Case No. 3307.

RESTORATION OF LAND VALUES FOR EACH YEAR FROM 1925 TO 1933, BOTH INCLUSIVE, AND TRENDS OF SUCH VALUES

	June 30, 1925	Last 6 mos. 1925	Year 1926	Year 1927	Year 1928	Year 1929	Year 1930	Year 1931	Year 1932	11 mos. 1933
Restoration Due to Becoming Useful										
Land Values Disallowed as Not Used and Useful:										
1. At 6-30-25—Trended Value—Percent of Line 2		100.00% A	98.73% B	96.97% C	99.20% D	101.45% E	95.65% F	93.95% G	88.71% H	102.96% I
2. —Trended Value—Amount	$686,613 A	$686,613 B	$677,896 C	$657,353 D	$652,094 E	$661,549 F	$632,772 G	$594,489 H	$527,371 I	$542,981
Periods During Which Disallowed Land Values Continued to Be Not Used and Useful:										
3. Parcel No. 17—Columbus, to July, 1925	2,430									
4. " " 21—Cleveland, to June, 1926	34,609 A	34,609								
5. " " 8—Toledo, to April, 1927	159,260 A	159,260 B	157,237							
6. " " 19—Cleveland, to May, 1927	309,664 A	309,664 B	305,731							
7. " " 18—Columbus, to February, 1928	20,300 A	20,300 B	20,042 C	19,435						
8. " " 1—Springfield, to October, 1928	22,500 A	22,500 B	22,214 C	21,541						
9. " " 17—Cleveland, to December, 1929	55,200 A	55,200 B	54,499 C	52,848 D	52,425					
10. " " 3—Dayton, to Date	72,500 A	72,500 B	71,579 C	69,410 D	68,855 E	69,853 F	66,814 G	62,772 H	55,685 I	57,333
11. " " 9—Toledo, to Date	7,000 A	7,000 B	6,911 C	6,702 D	6,648 E	6,744 F	6,451 G	6,061 H	5,377 I	5,536
12. " " 1—Coshocton, to Date	3,150 A	3,150 B	3,110 C	3,016 D	2,992 E	3,035 F	2,903 G	2,727 H	2,419 I	2,491
13. Total Trended Values During Periods of Non-Use	$686,613	$684,183	$641,323	$172,952	$130,920	$79,632	$76,168	$71,560	$63,481	$65,360
14. Total Restoration Due to Becoming Useful (2-13)		2,430	36,570	484,401	521,174	581,917	556,604	522,929	463,890	477,621
Restoration Due to Reduction of Book Net Additions										
15. Parcel No. 3—Dayton, Cr. Net Add'ns in June, 1929						84,082 F	80,424 G	75,558 H	67,028 I	69,012
16. Parcel No. 9—Toledo, Cr. Net Add'ns in Sept., 1930							7,023 G	6,598 H	5,853 I	6,026
17. Parcel No. 1—Coshocton, Cr. Net Add'ns in Jan., 1933										3,513
18. Total Restoration Due to Reduction of Net Add'ns						$84,082	$87,447	$82,156	$72,881	$78,551
19. Total Restored Land Values (Line 14 plus Line 18)		$2,430	$36,570	$484,401	$521,174	$665,999	$644,051	$605,085	$536,771	$556,172

NOTE.—The composite percentages shown on Line 1 were developed by the Commission's Engineers and represent the relation of values for each current period to the preceding period and they have been applied to the basic figures bearing corresponding alphabetical designations.

The totals on Line 19 are forwarded to Appendix "B", Line 7.

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IN THE

Supreme Court of the United States

Appeal from The Supreme Court of Ohio.

OCTOBER TERM, 1936.

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THE OHIO BELL TELEPHONE COMPANY,
Appellant,

vs.

THE PUBLIC UTILITIES COMMISSION OF OHIO,
Appellee.

APPELLEE'S BRIEF.

HERBERT S. DUFFY,
Attorney General of Ohio,
A. F. O'NEIL,
W. W. METCALF,
Assistant Attorneys General of Ohio,
Counsel for Appellee.

DONALD C. POWER,
Special Counsel,
For Appellee.
March 27, 1937.

TOOTHAKER & RODENFELS, Law Printers, Columbus, Ohio.

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Appellee.

APPELLEE'S BRIEF.

STATEMENT OF THE CASE.

Appellant, The Ohio Bell Telephone Company, seeks to reverse a judgment of the Supreme Court of Ohio, entered against it on July 22, 1936, affirming the findings

and orders of The Public Utilities Commission of Ohio of January 16, March 1, July 5, July 9 and September 6, 1934.

While separate appeals were taken by The Ohio Bell Telephone Company to the Supreme Court of Ohio for the purpose of reviewing the various orders of the commission hereinabove referred to, all of said appeals were consolidated into one case, briefed and argued as such and decided in one opinion. (R., 3, 533.)

Throughout this brief, the appellant, The Ohio Bell Telephone Company, will be referred to as the "company" and the appellee, The Public Utilities Commission of Ohio, will be referred to as the "commission".

History of the Case.

The proceedings presented for review arise out of the action of the commission subsequently affirmed by the Supreme Court of Ohio in what has come to be known as the state-wide Ohio Bell Telephone case, being properly so designated because it involved an inquiry into the value of the property and rates of that company for both exchange and toll service throughout the state of Ohio. (R., 714.)

Prior to the year 1914, Bell System service in Ohio was limited to the portions of the state served by The Cleveland Telephone Company, the Central Union Telephone Company, the Central District Printing and Telegraph Company and the Cincinnati & Suburban Bell Telephone Company, (the latter still operating as a separate company). (R., 6485, 6492A.) At the same time and

operating independently in the same territory in many localities were other telephone companies.

In July, 1914, a number of companies of the kind last referred to were consolidated under the name of The Ohio State Telephone Company. (R., 6365-7.) In December, 1920, The Cleveland Telephone Company (its name having been changed to The Ohio Bell Telephone Company) purchased the Ohio property of Central Union Telephone Company. (R., 6485.) In September, 1921, The Ohio Bell Telephone Company and The Ohio State Telephone Company were consolidated as The Ohio Bell Telephone Company (R., 6358-60), and that company thereafter purchased additional telephone properties. (R., 6488-6492A.) Even after these extensive consolidations there remained more than 450 other independent telephone companies operating in the state.

As soon as The Ohio Bell Telephone Company (consolidated) was ready to unify the service in communities having a dual service, it filed with the commission an application to determine the rates chargeable for such unified service. In the case of some of the exchanges the municipalities concerned contested the proposed rates and a hearing was instituted. Subsequently, following the 1923 amendment of *Section 614-20* of the Ohio Code *(110 Ohio Laws, 366)*, the company filed new rate schedules for many of its exchanges; some of which were protested by the municipalities concerned and were collected under bond, after the end of the statutory period of suspension. This was true also with respect to the com-

pany's new schedule of toll rates for its toll service throughout the entire state. (R., 6490-92.)

As a result, many extensive hearings were had by the commission, and in the two years prior to October, 1924, several thousand pages of testimony were taken and an even greater number of pages of exhibits offered in evidence. (R., 6491-2.)

On October 14, 1924, the commission, having found that many issues were common to all of the then pending Bell cases, both toll and exchange, ordered that they be consolidated and that the examination into the rates proceed as a single state-wide case involving all the rates and services, exchange and toll, of The Ohio Bell Telephone Company, including those then under investigation, and that the evidence theretofore introduced, in the several separate cases, be considered and made a part of the record in the consolidatd cases. (R., 714-17.)

This order concluded as follows:

> "Ordered, that, on or before December 1, 1924, said the Ohio Bell Telephone Company furnish to this commission and file in this cause, as a part of the evidence therein, a complete inventory of all of its property located in the state of Ohio and used and useful and to be used and useful, in the furnishing of telephone service therein, both toll and exchange, classified according to the classification adopted and prescribed by this commission and the Interstate Commerce Commission for telephone companies, and that, upon the filing of such inventory, this consolidated case proceed to a hearing for the determination of the fair value of said property and of the just and reasonable rates for the service thereby to be furnished by said company to its patrons throughout the state of Ohio."

By this order, forty-three separate cases then pending, the majority of which were for increased rates, were consolidated into the state-wide case*.

Following the order of consolidation, the company made additional filings of exchange rates, some of which were protested by the municipalities involved and subsequently, collected under bond. (R., 6490.)

The company filed and offered in evidence an inventory and appraisal of its entire property. (R., 7421.)

In February, 1927, the case was submitted to the commission for the fixing of a tentative value, but before this valuation was announced, the then attorney general requested that the case be re-opened and further valuation testimony taken. (R., 123.)

Following that date much time was consumed in taking testimony on behalf of the state, with rebuttal evidence on behalf of the company, and in April of 1930 the case

* Note: Under the provisions of the Ohio law then in effect (The Pence Law, Section 614-20, passed April 4, 1923, 110 Ohio Laws, 366, which amended the Robinson Law, 108 Ohio Laws, 1094, and which has since been repealed, 113 Ohio Laws, 17) a public utility could increase its rates by filing with The Public Utilities Commission of Ohio a schedule of the proposed rates and the commission upon complaint or upon its own initiative without complaint could suspend the effective date of said increased rates for a period of not to exceed one hundred and twenty days and at the end of the suspension period if the validity of the increased rates had not then been established the increased rates would become effective upon the public utility filing with the commission a bond or other security, guaranteeing the repayment, with interest at 6% from the date of payment by the consumer until the date of repayment by the utility of any excessive rates found by the commission to have been collected.

was again submitted to the commission for its finding on tentative value. (R., 3224.) This tentative valuation finding was issued on January 10, 1931 (R., 121, 144), and wherein the commission found the present value of the total property of the company as of June 30, 1925 (pursuant to *Sec. 499-9* of the Ohio General Code, the commission adopted June 30, 1925, as the "date certain" for the purpose of valuing appellant's property; R., 126, 166), to be $104,282,735.

On February 7 and February 9, 1931, protests to this finding were filed on behalf of the company and the state respectively. Hearings on the protests were held on March 3 and 4, 1931. At that time counsel for the company stated that the company was then preparing exhibits to show Western Electric profits, cost of license contract services rendered by American Telephone & Telegraph Company and separation of plant revenues, and expenses, as between interstate and intrastate usage in accordance with the interpretation which counsel placed upon the decision of the Supreme Court of the United States in the case of *Smith v. Illinois Bell Telephone Company,* 282 U. S., 133.

On April 17, 1931, hearings were resumed for the presentation of this testimony proffered by the company.

On June 17 and 18, 1931, during the cross examination of Mr. Charles A. Heiss, comptroller of American Telephone and Telegraph Company, and Mr. R. H. Gregory,

comptroller of Western Electric, certain requests were made for detailed information underlying their exhibits and testimony. (R., 3520-26, 3537-3538.) In July of that year the company furnished certain data in accordance with its version of these requests. (R., 8213 et seq.; 8248 et seq.)

A hearing was had on September 28, 1931, on the requests and a few days later a revised list, dated October 1, was submitted.

On December 5, 1931, the company filed a brief styled "memorandum responsive to state's official request for information." A reply to the company memorandum was filed with the commission on December 28, 1931. The matter again came on for hearing on January 27, 1932.

On April 22, 1932, the commission issued its order in regard to the requests, approving some, denying others, and directing the attorney general and the company to expedite the proceedings. (R., 8305.)

The company continued to furnish data in compliance with this last order, the last being received on June 22, 1932. Practically all of the data requested related to American Telephone & Telegraph Company and Western Electric Company.

During the entire year 1932 the Chicago case of Illinois Bell was going forward, volumes of testimony and exhibits being introduced at hearings before Judge Wilkerson, as a result of the decision of the Supreme Court of

the United States remanding that case to the statutory court for further findings. (*Smith v. Illinois Bell Telephone Company*, 282 U. S., 133.) This evidence so introduced in the Illinois case relating to the same general issues that were being presented to the Ohio commission.

Hearings were concluded and that record (Chicago case) closed early in the fall of 1932 and all of the issues thoroughly briefed by counsel on each side. Five days were allotted early in December for oral argument before the full statutory court of three judges at which time that case was submitted for decision.

Subsequently, it was found that the material furnished by the company in professed compliance with the request made in June was inadequate and not responsive.

A great deal of time would have been necessary to formally introduce the same or similar testimony into the record of this case so when hearings were resumed in this case on December 19, 1932, before the commission a stipulation was worked out between counsel to file therein the testimony and exhibits in the Chicago case in so far as it related to the four issues, namely, Western Electric profits, American Telephone and Telegraph license contract service costs, separation of interstate and intrastate plant, revenues and expenses, and rate of return. As a result of this stipulation many days of hearing were saved. The stipulation provided, in substance, that the new record made in the Chicago case be incorporated in this record covering the testimony of certain specified witnesses and exhibits introduced through them and it also provided that all such evidence was introduced sub-

ject to the same objections made in the Chicago case. Certain additional exhibits relating to the Ohio company were introduced by stipulation, such exhibits having been prepared in the same manner as their correspondingly numbered exhibits in the Chicago case. The stipulation further provided for the introduction into this record of the requests made on behalf of the state, heretofore referred to, and the material furnished by the company in response thereto.

On December 29, 1932, the record in this case was closed on the introduction of certain testimony and exhibits of company witnesses and Mr. E. W. Wood on behalf of the state. Subsequently, under date of January 16, 1934, the commission made and entered its final order in this case (R., 154, 247), fixing the value of the property of The Ohio Bell Telephone Company as of June 30, 1925, the date certain in this case, and for each of the years subsequent thereto, through the year 1933. Thereafter the commission's orders of March 1, July 5, July 9 and September 6, 1934, followed. (R., 273; 303; 308; 372.)

Orders and Opinions in the Case.

The commission's order of January 16, 1934 (R., 247) based upon its opinion and finding of the same date (R., 154) corrected by its order of March 1, 1934 (R., 273) fixed the final valuation of the intrastate property of The Ohio Bell Telephone Company at $93,707,488 as of June 30, 1935, the "date certain." The value for each succeeding year to and including 1933 was also fixed by the

commission. The above described orders also required The Ohio Bell Telephone Company to refund to its subscribers in the state of Ohio the sum of $13,289,172 which amount the commission found to be the excess earnings of The Ohio Bell Telephone Company from its entire intrastate operations for the years 1925 to 1933 inclusive, and further directed The Ohio Bell Telephone Company to file a schedule of reduced rates effective as of June 30, 1925, and thereafter, until changed by order of the commission. Subsequently, the commission made two reductions in the amount of refunds originally ordered. The first reduction of $1,121,494 was made in the commission's order of July 5, 1934 (R., 303) for the reason that a part of the excess earnings found by the commission to have been collected by The Ohio Bell Telephone Company were referrable to rates not collected under bond, and under the laws of Ohio probably not subject to refund.

The second reduction in the sum of $335,414 was made in the commission's order of September 6, 1934 (R., 372) for the purpose of correcting an error. The amount of the refunds finally fixed by the commission in its order of September 6, 1934 was $11,832,264 with interest from the date of payment by the respective subscriber of said excessive charges, to the date of repayment by The Ohio Bell Telephone Company.

In its order of July 9, 1934 (R., 308) the commission required The Ohio Bell Telephone Company to show cause why its future rates should not be reduced.

The Supreme Court of Ohio approved the findings and

affirmed the orders of the commission in their entirety (R., 533) and the opinion of that court is reported in *131 O. S., 539* to *602*, and in *3 N. E. (2d), 475* to *501*.

In its order of July 9, 1934 the commission required the company to show cause why its future rates should not be reduced. But in none of the orders heretofore referred to did the commission fix rates to be charged in the future. The commission's failure to fix rates for the future was included in appellant's assignments of error filed in this court (Assignments of Error 9) and in its brief appellant calls the attention of the court to that fact. (Appellant's brief, p. 2.)

In this connection, this court will be interested in knowing that on the twenty-ninth day of January, 1937 in this same proceeding, the commission, with the consent and acquiescence of the company, issued its finding and order fixing the rates of the appellant to be charged for the future beginning April 1, 1937. The rates so fixed being a reduction of the contested rates in an amount of approximately $1,912,000 per annum. This finding and order of the commission is not yet reported.

ERRORS COMPLAINED OF AND ISSUES PRESENTED.

Under the heading "Specification of Assigned Errors Intended to be Urged", at page 16 of its brief (Appellant's brief, p. 16), appellant recites that there are fifteen assignments of error (R., 18) and that all errors assigned are relied upon except Assignment 9 and 10, Subdivision (b) of Assignment 12, Subdivisions (d) and (e) of Assignment 13 and Assignment 14.

The points now relied upon by appellant do not include many of the issues presented by the appellant in the Supreme Court of Ohio, including many of the questions on the valuation of the appellant's property, a substantial number of the questions raised in connection with the appellant's license contract with American Telephone & Telegraph Company, the question of the fair rate of return, the question of depreciation of telephone instruments, the question of existing depreciation or percent condition and the commission's attempt to reduce future rates.

The points relied upon by the appellant in this court are:

(1) Under the topic of valuation as of June 30, 1925—the four items of omitted land, going value, Western Electric prices and costs and reproduction costs.

(2) The method adopted by the commission, and approved by the Supreme Court of Ohio, of determining the

fair value of appellant's property for the years 1926 to 1933 inclusive.

(3) The amount allowed by the commission and approved by the Supreme Court of Ohio as appellant's expense of depreciation for each of the years 1926 to 1933.

(4) The action of the commission, approved by the Supreme Court of Ohio, in disallowing certain payments made by appellant to American Telephone and Telegraph Company for the period of 1925 to 1932.

(5) The method of allocating the refunds ordered by the commission to the various municipalities involved.

In this brief, appellee has confined itself, in the main, to answering the arguments presented by the appellant in its brief. Many additional arguments might have been advanced by appellee to sustain its position, but in the interest of economy of time, space and money, it has, in the main refrained from discussing any element not raised in the brief of appellant.

SUMMARY OF ARGUMENT.

I.

VALUATION.

(Infra, pp. 24 to 75.)

The value of the company's property fixed by the commission as of June 30, 1925, and for the succeeding years, including 1933, represents the fair and just value of the property of the company for rate-making purposes.

THE "DATE CERTAIN".

(Infra, p. 24.)

In every rate case a definite date must be selected as a basis for the valuation of the company's property for rate-making purposes. *(Ohio General Code, Sec. 499-9.)* This date, commonly called the "date certain", in the present case was June 30, 1925.

THE COMMISSION'S TENTATIVE REPRODUCTION VALUE AS OF JUNE 30, 1925.

(Infra, p. 25.)

The commission's tentative value as of June 30, 1925, of all the company's property was $104,282,735. The tentative value of the intrastate property was $101,346,634. The tentative value fixed by the commission is subject to protest and hearing thereon after which the final value is fixed by the commission.

THE COMMISSION'S FINAL VALUE AS OF JUNE 30, 1925.

(Infra, p. 27.)

The commission's final value as of June 30, 1925, of all the company's property was $96,422,276. The final value of the intrastate property was $93,707,488.

For the purpose of ascertaining the fair value of the company's property as of June 30, 1925, the commission

considered the thousands of pages of testimony introduced in this case, together with the thousands of exhibits submitted. Upon the basis of this evidence the commission placed a value upon all of the separate items making up the property of the company devoted to the service of the public in the rendition of telephone service to its subscribers.

ITEMS OF COMMISSION'S FINAL VALUE NOW CHALLENGED BY APPELLANT.

(Infra, p. 27.)

Many of the items making up the final value of appellant's property as of June 30, 1925 and challenged by the appellant in the court below, are not now being urged by it in this court. Included in the items so omitted are the following: Construction work in progress, undistributed construction costs, the distributing system, working capital, right of way and existing depreciation or percent condition.

The only questions as to the valuation of appellant's property as of June 30, 1925 now presented for this court's consideration in appellant's brief are: (1) omitted land, (2) going value, (3) Western Electric prices and (4) cost and reproduction cost.

Omitted Land. (Infra, p. 28.)

For the item of land, Account 211, the commission allowed the sum of $3,256,854 this being the full amount claimed by the company less only the value of land not

used and useful. When land purchased by the company for future use actually became used and useful it was included in the valuation and allowed by the commission.

This procedure followed by the commission was in accordance with the provisions of the Ohio Statutes *(General Code, Secs. 499-8, 499-9, 614-20, 614-23)* and with the decisions of the Supreme Court of Ohio and of this court.

Logan Gas Company v. Public Utilities Commission of Ohio, 121 O. S., 507;
Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 127 O. S., 109, 117, 122;
Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398, 78 L. Ed., 1327;
Dayton Power & Light Company v. Public Utilities Commission of Ohio, 127 O. S., 137;
Dayton Power & Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 78 L. Ed., 1267.

Going Value. (Infra, p. 31.)

Where evidence that reproduction cost new less depreciation, using current prices as of a date certain, plus liberal general overheads, working capital and material and supplies is given due consideration in connection with other competent evidence in arriving at fair value, it is manifest that under the law, going concern value has been given all the consideration it deserves and no separate allowance therefor is necessary. This principle has long been recognized as the rule of the Supreme Court of Ohio and it has been fully recognized and applied by this court

in its most recent decisions. It is particularly applicable where, as here, the evidence on going value is purely conjectural and speculative and based on elaborate calculations as to the theoretical cost of attaching business.

Cincinnati & Suburban Bell Telephone Company v. Public Utilities Commission of Ohio, 113 O. S., 259;
The Hardin-Wyandot Lighting Company v. Public Utilities Commission, 118 O. S., 592, 603;
Portsmouth Gas Company v. Public Utilities Commission, 119 O. S., 24;
Columbus Gas & Fuel Company v. Public Utilities Commission, 127 O. S., 109;
City of Houston v. Southwestern Bell Telephone Company, 259 U. S., 318;
Galveston Electric Company v. Galveston, 258 U. S., 388;
Des Moines Gas Company v. City of Des Moines, 238 U. S., 153;
Dayton Power & Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 308; 78 L. Ed., 1267, 1280;
Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398; 78 L. Ed., 1327.
St. Joseph Stock Yards Co. v. United States, 298 U. S., 38; 80 L. Ed., 1033.

Western Electric Prices. (Infra, p. 43.)

Where the commission, in determining the reproduction cost of the property of The Ohio Bell Telephone Company as of June 30, 1925, allowed the full amount contended for by the company as the cost of equipment purchased from Western Electric, with the exception of the increase in price of 10.2% claimed by Western Electric

and effective November 1, 1930, the commission has allowed a fair and reasonable price to the company for its purchases from Western Electric and its finding has the approval of the highest courts in the land.

Smith v. Illinois Bell Telephone Company, 282 U. S., 133, 75 L. Ed., 255;
Illinois Bell Telephone Company v. Gilbert, 3 F. Supp., 595;
Lindheimer v. Illinois Bell Telephone Company, 292 U. S., 151; 78 L. Ed., 1182.

Cost and Reproduction Cost. (Infra, p. 47.)

The commission in its valuation gave full consideration to both reproduction costs new and the actual cost of the property of the appellant.

Existing Depreciation or Percent Condition. (Infra, p. 49.)

The company now apparently does not challenge the finding of the commission, approved by the court below, to the effect that the property of the company used and useful in rendering telephone service in the state of Ohio was in a percent condition as of the "date certain" of approximately 87%. Inasmuch as this finding of the commission was fully sustained by the testimony adduced and was further substantiated by an examination of the financial history of the company and is not now challenged by the company in its brief it can be assumed to be correct.

THE COMMISSION'S FINDING OF VALUE FOR 1926 AND SUBSEQUENT YEARS FOR RATE-MAKING PURPOSES.

(Infra, p. 50.)

Upon the basis of the thousands of pages of testimony and the thousands of exhibits which were introduced into the record of this case, the commission determined that the fair present value of the intrastate property of The Ohio Bell Telephone Company devoted to the public service as of June 30, 1925, was $93,707,488. This finding of the commission was made on January 16, 1934, approximately nine years after the "date certain" of June 30, 1925. It was therefore necessary for the commission to ascertain by some appropriate method the fair value of the company's property for each of the years succeeding 1925. Using the valuation of June 30, 1925, as the basic value, the commission computed the value for each succeeding year by applying price indices for telephone property to that basic value for each year involved, and then added to the result so obtained the full net additions made by the company in each year at 100% in order that the fair value in each of the years might be accurately portrayed. The method followed by the commission was a fair and reasonable one, was based upon evidence and was the only practicable method by which the fair value of the company's property for the years succeeding 1925 could be ascertained.

II.

OPERATING EXPENSES.

(Infra, pp. 75 to 127.)

The importance of determining the proper amount to be allowed as operating expenses has been recognized by this court in the recent case of *Lindheimer v. Illinois Bell Telephone Company*, 292 U. S., 151, 54 S. Ct., 658, 78 L. Ed., 1182 (1934). With the exception of the amounts claimed by the company for the expense of depreciation, license contract costs and Western Electric purchases chargeable to expense, the commission allowed without question all of the operating expenses contended for by the company.

DEPRECIATION.

(Infra, p. 77.)

The rates of depreciation prescribed by the commission are equitable and sufficient to permit the company to make normal replacements of property due to wear and tear, obsolescence and inadequacy and to maintain the physical plant in a proper state of efficiency.

LICENSE CONTRACT PAYMENTS.

(Infra, p. 110.)

An administrative body such as The Public Utilities Commission of Ohio, in passing upon the reasonableness of the operating expenses of a public utility operating under its jurisdiction, is not bound to accept as conclusive the amounts allegedly paid by such public utility to its parent company for services presumably rendered by the parent company to the operating company under a license contract made between these affiliated concerns but such an administrative body may inquire into the value and the propriety of such services and upon the basis of the evidence introduced and in the exercise of its administrative discretion, it may determine the fair and reasonable value of the services and the propriety thereof, and this determination made upon proper evidence should not be disturbed by any reviewing court.

Western Distributing Company v. Public Service Commission of the State of Kansas, 285 U. S., 119, 75 L. Ed., 655;

Smith v. Illinois Bell Telephone Company, 282 U. S., 133, 75 L. Ed., 255;

Dayton Power & Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 78 L. Ed., 1267;

Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398; 78 L. Ed., 1327.

Field Occupied by The American Telephone and Telegraph Company. (Infra, p. 115.)

It is important to a complete understanding of this case to comprehend the varied activities of the American Telephone and Telegraph Company and to understand the wide field occupied by it.

III.

THE CONTENTION OF THE COMPANY AS TO "REFUNDS IMPROPERLY ORDERED."

(Infra, pp. 128 to 139.)

The claim of the company that the commission has erroneously ordered it to refund to the telephone subscribers of Ohio entitled thereto the sum of $11,832,264 is predicated upon the objection of the company to the method used by the commission in allocating this refund to the various municipalities concerned, it being the contention of the company that in order that these refunds might be properly ascertained the commission must of necessity conduct a separate valuation proceeding for each of the communities involved and upon the basis of this valuation proceeding allocate to each community the amount of the refunds to which it is entitled. While the commission recognized that this was one method of allocating the refunds to the various communities the commission was of the opinion that it was not the only method and that to have applied it would have resulted in intolerable de-

lays and would have resulted in the scrapping of substantially all of the work that had been done over a period of ten years under the theory of a state-wide telephone investigation. The commission, therefore, adopted another method of allocation which was perfectly sound in principle and is not injurious to the company. With but one exception the method adopted by the commission has met with the approval of the municipalities concerned and the company should not now be heard to complain because it feels that a better method might have been chosen.

IV.

APPELLANT'S FINANCIAL EXPERIENCE.

(Infra, pp. 140 to 146.)

Upon the basis of the commission's findings the appellant's book surplus at November 30, 1933 would be $10,682,929 *after* the payment of that portion of its excessive earnings found by the commission to be refundable to its subscribers in the amount of $11,832,264 while at the same time its reserve for depreciation would have been $14,652,468 instead of $21,999,901 as shown by the company's books. In other words, at November 30, 1933 the appellant should have had a book surplus of $22,515,193 with a reserve for accrued depreciation of $14,652,468. That the appellant has seen fit to deplete its surplus by excessive credits to its depreciation reserve in addition to excessive payments to American Telephone & Telegraph Company and Western Electric Company should not mislead any careful student of the facts.

ARGUMENT.

I.

VALUATION.

The value of the company's property fixed by the commission as of June 30, 1925, and for the succeeding years, including 1933, represents the fair and just value of the property of the company for rate-making purposes.

The starting point in this case is the valuation of the company's property devoted to the public service for the purpose of determining the rate base and a large part of the volumnious record adduced in this case is concerned with that question.

THE DATE CERTAIN.

In every rate case a definite date must be selected as a basis for the valuation of the company's property for rate-making purpose. This date, commonly called the "date certain", in the present case was June 30, 1925.

It is recognized that for valuation purposes a definite date must be selected as the date of the valuation. This date, known as the "date certain", was June 30, 1925. (R., 126; 166.)

Under the Ohio statutes a valuation fixed by the commission in a rate case is subject to protest *(Sec. 499-12, Ohio General Code)*. The original valuation fixed by the commission is known as the "tentative value". If no

protest is filed this tentative value becomes the "final value". If a protest is filed the commission is required to hear the protest and thereafter to fix a final value which may be either the tentative value or a modification thereof.

THE COMMISSION'S TENTATIVE REPRODUCTION VALUE AS OF JUNE 30, 1925.

The commission's tentative value as of June 30, 1925, of all the company's property was $104,282,735. The tentative value of the intrastate property was $101,346,634.

In this case the tentative value of all the company's property as of June 30, 1925 (including both interstate and intrastate property), was fixed by the commission in its order of January 10, 1931, at $104,282,735 (R., 145). No tentative value as to the purely intrastate property was fixed but by applying the intrastate percentage arrived at in the final valuation (97.18448%) to the tentative value of $104,282,735 produces, for comparative purposes, a tentative intrastate valuation of $101,346,634 (R., 243).

Protests were filed to this tentative valuation on behalf of both the company and the state (R., 158). These protests were duly heard and thereafter the commission in its order of the sixteenth day of January, 1934, fixed a final valuation for all of the company's property of $96,422,276 and for the purely intrastate property of $93,707,488 (R., 195).

Counsel for the company in their brief evidence some

surprise at the action of the commission in reducing the amount of the tentative intrastate valuation by the sum of $7,639,146. This reduction in the tentative value was made up of the following items:

(a) A reduction in the sum of $316,090 in Account No. 207, right of way;

(b) By disallowing the sum of $3,490,905 as going concern value;

(c) A reduction in the amount allowed for working capital, including materials and supplies, in the sum of $535,970;

(d) A reduction in the sum of $3,296,181 in undistributed construction costs.

Inasmuch as the very purpose of *Section 499 12, Ohio General Code,* is to provide for a hearing on the tentative value and the adjustment thereof in such manner as the commission may feel is necessary, it is difficult to understand why a modification of the tentative value should occasion such grave concern as to the propriety of the commission's action. (Cf. *St. Joseph Stock Yards Company v. United States of America,* 298 U. S., 38; 80 L. Ed., 1033.)

It is significant that in spite of the company's criticism of the commission's action in reducing the final value as hereinbefore described, the only item in the reduction of which the appellant complains in this court, is the item of going value.

THE COMMISSION'S FINAL VALUE AS OF JUNE 30, 1925.

The commission's final value as of June 30, 1925, of all the company's property was $96,422,276. The final value of the intrastate property was $93,707,488.

For the purpose of ascertaining the fair value of the company's property as of June 30, 1925, the commission considered the thousands of pages of testimony introduced in this case together with the thousands of exhibits submitted. Upon the basis of this evidence, and in the exercise of its proper judgment, the commission placed a value upon all of the separate items making up the property of the company devoted to the service of the public in the rendition of telephone service to its subscribers. (R., 231, 234.) Its finding in this respect was affirmed by the Supreme Court of Ohio (R., 533, 568-571).

ITEMS OF COMMISSION'S FINAL VALUE NOW CHALLENGED BY APPELLANT.

Many of the items making up the final value of appellant's property as of June 30, 1925, and challenged by the appellant in the court below, are not now urged by it in this court. Included in the items so omitted are: construction work in progress; undistributed construction costs; the distributing system; working capital; right of way and existing depreciation or per cent condition. This abandonment by the appellant of subtantially all of

the individual items going to make up the final value of its property as of June 30, 1925, is a tacit admission of the correctness of the final value fixed by the commission and affirmed in the court below.

The only questions relating to the valuation of appellant's property as of June 30, 1925, presented in appellant's brief for this court's consideration are: (1) omitted land (2) going value (3) Western Electric prices and (4) cost and reproduction cost. We shall discuss them in the order named.

(1) Omitted Land.

When the value placed upon land—Account 211, grants to the company the full amount claimed by it less only the value of land not yet used and useful the item has been given all the value to which it is entitled under the law.

The following evidence as to the valuation of this account was introduced in this case:

Reproduction Values at June 30, 1925.

Commission's final valuation	$3,256,854	(R.,231)
Books	2,693,406	(R., 7395)
Valuations submitted by the company:		
Williams	3,943,467	(R., 8159)
Sloan	3,943,467	(R., 7258)
Valuations submitted by state:		
Hagenah	3,943,467	(R., 6742A)
Allensworth	3,943,467	(R., 6245)
Tentative valuation	3,256,854	(R., 143)

It will be observed that Witnesses Williams, Sloan and Hagenah agreed upon $3,943,467 as the reproduction value of the land owned by the company. That amount is $686,613 greater than the commission's tentative and final valuation and is occasioned by the fact that the commission excluded certain parcels of land included in the valuation as not being used and useful at the date certain. The commission based its refusal to include the value of such real estate in the rate base upon the theory that the statutes of Ohio *(G. C., Sections 499-8, 499-9, 614-20, 614-23, etc.)* are explicit in that only used and useful property shall be included in the rate base and that lands purchased for future use must be excluded, but that their value may be considered to enhance the rate base as of the date when they actually became used and useful. This procedure was followed by the commission and when and as the particular parcels of land in question actually were put in use by the company they were then included in the rate base of this account (R., 160; 233). By this procedure, the sum of $586,959 was added to the valuation of the company's property by the commission after the date certain of June 30, 1925. In spite of the fact that substantially all of this property did not become used and useful in serving the public until from two to four years after the date certain (R., 233) the appellant insists that the commission should have included it in the valuation as of the date certain. The procedure followed by the commission finds additional justification in the fact that some of the parcels never became useful (Appendix C, Commis-

sion Finding, R., 233). Certainly, the company cannot criticise the commission for the attitude which it has taken in respect to this account.

Logan Gas Company v. Public Utilities Commission of Ohio, 121 O. S., 507;
Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 127 O. S., 109, 117, 122;
Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398, 78 L. Ed., 1327;
Dayton Power & Light Company v. Public Utilities Commission of Ohio, 127 O. S., 137;
Dayton Power & Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 78 L. Ed., 1267.

The cost of this item, as shown on the books of the company, is $2,693,406, including parcels which were excluded by the commission as of the "date certain", and the value of these parcels is $686,613. Consequently, the book value of the land in use as of the "date certain" was $2,006,793. The amount allowed by the commission as of the "date certain" was $3,256,854, or $1,250,061 in excess of the actual cost of the property to the company.

(2) Going Value.

Where evidence of reproduction cost new less depreciation, using current prices as of a date certain, plus liberal general overheads, working capital and materials and supplies is given due consideration in connection with other competent evidence in arriving at fair value, it is manifest that under the law, going concern value has been given all the consideration it deserves and no separate allowance therefor is necessary.

The company through its witnesses Schneider (Exhibit 3, R., 7121), Williams (Exhibit 11, R., 8161) and Sloan (Exhibit A-1, R., 7258) contended for a going concern value of from $20,768,158 to $22,493,551. In other words, to a property with a fair value of $93,707,488 as of the date certain the company attributed a going concern value in excess of $20,000,000. The commission refused to allow this fanciful claim of the company for a wholly intangible item, in the following language:

> "Considering that our valuation is of a plant in actual and successful operation, and that we have made (post) what we regard as ample allowance for direct and undistributed overhead construction costs and that no specific costs have been established that are not covered by such allowance, and considering also that many items testified to are 'too obviously conjectural' and giving weight to the definite declarations of both the Supreme Court of the United States and of the state of Ohio, we have concluded that the testimony offered does not justify a separate allowance of going concern value, either as such or as 'cost of establishing business'. We therefore now hold that the amount, tentatively allowed

by the commission, of $3,592,040.00 as going concern value should be eliminated as a separate item." (Commission opinion, R., 173.)

That the commission's action in refusing to make a separate allowance for going concern value was fully sustained by the facts and the law is not subject to serious dispute.

It should be remembered that all of the items included in "the cost of establishing business", as testified to by the company's witnesses were in the nature of operating expenses, and had they actually been incurred by the company they would have been charged to operating expenses on its books (R., 1335-37). Many similar items of expense were so incurred and charged to operating expense by the company during the period under review and all of those charges have been allowed in full by the commission as operating expenses. As a matter of fact, these expenses are of a constantly recurring nature and are specifically provided for and classified as operating expenses in the uniform system of accounts for telephone companies as prescribed by the Interstate Commerce Commission, adopted by the Ohio commission, and followed by the company. It should be noted that all manner of repairs, wages, supplies, traffic, commercial and general expenses are provided for under Accounts Nos. 601 to 676, inclusive, and particularly that in addition to the detailed classifications and definitions for each account wherein various elements defined by the company's witnesses as cost of establishing business would be charged,

specific provisions is made in particular accounts for such elements as follows:

Account 627—Operators' schooling.
Account 642—Advertising.
Account 643—Canvassing.
Account 644—Sublicensee relations.
Account 646—Revenue accounting.
Account 649—Directory expense.
(R., 7023/34.)

It should be further noted that at December 31, 1924 there were prepayments of $250,510 as shown for Account 128 under Wood Exhibit No. 1 (R., 8171) which under the company's accounting methods could be charged to expenses during subsequent periods and which were allowed in full by the commission as and when such charges to expenses were made.

The commission could not in justice permit the company to earn a return upon the capitalization of an expense, which expense itself has been claimed and allowed in the determination of a fair return. To permit such a claim would result in requiring the telephone patrons not only to pay the entire amount of these expenses but also to pay a return upon the capitalized value thereof.

It is true that none of the witnesses either for the company or the state included any specific element for going concern value in any direct or indirect overhead allowances but it is also true that having completed the theoretical reconstruction of the property according to the program contemplated and the method of valuation adopted as of June 30, 1925, everything would be in readiness for the immediate commencement of operations

not later than the morning of July 1, 1925. All subscribers would be connected with the switchboards, their telephones would have been tested, inspected and ready for use, the supervisory employees provided for in the overhead allowances would have engaged the necessary personnel and would have purchased the required supplies, buildings and offices would be fully equipped, directories would be issued and paid for, out of working capital, the cost being carried in Account No. 132—prepaid directory expenses for distribution and absorption in Expense Account No. 649—directory expenses during the period of use per Interstate Commerce Commission regulations, and, in fact, the whole picture would be throbbing with activity and expectancy pending arrival of the actual minute of time when telephone service would begin. It is inconceivable that it would cost the company millions of dollars in addition to the millions already expended as allowed by the commission, to give such a picture the breath of life that would set it in motion, when the only requirement to transmute this fully equipped enterprise into a going concern would be the lapse of time measured by the tick of a clock at twelve o'clock midnight on June 30, 1925.

We should like to call the court's attention to a further fact and that is that all of the reserve facilities, provisions and plans made for future growth have been included and allowed in the inventory and appraisal as though they were plant actually in service. Such a plant has been considered useful if not actually used, and having been thus actually included in the value of physical

property no further consideration should be given to it in a separate allowance for going concern value. The examples of these reserve facilities and their presence throughout the plant are numerous but a few of them may be suggested as follows:

1. Underground conduit containing, for example, six ducts of which only two or three are actually used and the others held in reserve for future use, has been allowed in full.

2. Aerial and underground cable of larger capacity than present requirements demand, contain hundreds of extra cable pairs to care for future growth and all of these have been allowed in full.

3. Practically all switchboards and other equipment of central offices have a much greater capacity than present requirements demand and could accommodate a sizeable growth in subscribers without further capital investment, and all of these facilities with their extra capacity have been allowed in full.

4. Poles carrying only one or two cross-arms supporting less than the maximum number of wire circuits, are in many instances larger or heavier than actually required and these have been allowed in full with their additional capacity to accommodate considerable expansion in the distributing system.

5. Practically all of the newer buildings and many of the old, contain more space than would be actually required and have been built with the idea in view of future expansion and the value of these with their extra facilities have been allowed in full.

The commission did not criticize the company for these provisions for the future, but, in fact, commended it for its foresighted policy in making reasonable provision for future growth and has not hesitated to allow the full value of such provisions as contained in the inventory and appraisal, but the commission did not feel justified in again making an allowance in the form of going concern value to cover this element or to compensate the company an additional amount for having exercised its judgment in providing such facilities.

Company's Method of Arriving at a Theoretical Going Value Has Been Repeatedly Disapproved by This Court.

The contention of the company for going concern value was based primarily upon the introduction of testimony relating to the cost of establishing business—a method which has been expressly disapproved by this court (*Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio*, 292 U. S., 397). It lays great stress upon the evidence introduced in this record with respect to going value and in its brief (Appellant's Brief, p. 82) asserts that going value " • • • was established by the evidence of every witness testifying on the subject."

An examination of the evidence so strongly relied upon by the appellant is indeed interesting. It discloses that the company produced three witnesses who testified as to going value. Witness Schneider arrived at a going concern value, denominated by him as the cost of establishing business, of $20,76[illegible],158. (R., 1366;

Schneider Ex. 3, R. 7121). He described the method by which this amount was determined in the following language:

> "To ascertain or determine the amount or cost of establishing business included in that figure, I have subtracted the plant additions during the quarter-year period, the sum being $126,912,935, plus the interest during construction amount of $7,481,264, leaving what in my judgment is the cost of establishing business amount of $20,768,158." (R. 1366.)

Schneider's testimony clearly indicates that he did not use any actual expenditures made by the appellant as the basis for arriving at his conclusions on going concern value (R., 1336), and it further indicated that such expenditures when made had been charged by the company to their proper accounts (R. 1337). In reaching his conclusions as to going value Schneider relied to a very large degree upon the theoretical cost of attaching business (R. 1339), a method criticized by this court in the case of *The Columbus Gas and Fuel Company v. Public Utilities Commission of Ohio*, supra.

Williams, who likewise testified on behalf of the company as to going value (R. 1369), stated that he had made no separate study of his own as to going concern value but that he had given thought and study to the costs for going concern value or the cost of establishing business as presented by Schneider and that from this study he had reached the conclusion that Schneider's fig-

ure of $20,768,158 was correct. (Williams Ex. 11, R. 8161.)

Sloan who also testified on behalf of the company likewise used the cost of attaching business theory in determining the cost of establishing business of The Ohio Bell Telephone Company at the date certain. (R. 1759.) Sloan admitted that he had not tried to make a complete determination of going value (R. 1760), but in spite of that fact, his figure for this item was modestly placed at $22,493,351. (R. 1772.)

Special reliance is placed by the appellant on the testimony of Hagenah, the only state witness who testified as to going value. For that reason, some of Hagenah's statements as to going value are of particular interest. We quote but one of them:

> "Going concern value like the value of any item of property or class of property must necessarily be a matter of judgment. No one can prove the amount of it. * * *" (R. 2080.)

Hagenah like the other witnesses who testified on this subject then proceeded in an attempt to establish a going concern value by using the cost of attaching business theory (R. 2081) along with other theories. The fact is that the going concern value testified to in this case was determined in a purely speculative fashion and upon estimates based upon pure assumptions in a manner recently disapproved by this court in the case of *St. Joseph Stockyards Company v. United States of America*, 298 U. S. 38, 80 L. Ed., 1033.

It is upon this type of testimony that the company

bases its claim for an allowance in excess of $20,000,000 for going concern value. The fallacy of such reasoning we believe is self-evident. The company would have us disregard the fact that trained employees are just as much physically in existence as of a date certain as the necessary material such as "telephone lines," etc. When such employees are hired their degree of training is evidenced by their salary. Under the company's theory they would capitalize the cost of such theoretical training thus making the rate-payer pay a return on such salary. After we have literally reconstructed the plant just as it is, the company desires to have us assume that there would be a certain amount of "trying out" and adjusting to produce the most satisfactory degree of service. Again they seek to capitalize something which has been paid for as an operating expense or which is non-existent.

It is clear that where fair value is fixed upon evidence such as was before the commission no additional separate allowance for going concern value is allowable as a matter of law and were this not so, as it is, the company has wholly failed to sustain the burden of establishing any separate element of going concern value by evidence either competent or of probative value. The law is well settled, both under the decisions of the Supreme Court of Ohio and of this court, that where the property of a utility is valued, not as junk or property lacking utility, but as a going plant in successful operation, the element of going value has been given all the consideration which

it deserves, and no additional separate allowance for going concern value is permissible.

Cincinnati & Suburban Bell Telephone Company v. Public Utilities Commission of Ohio, 113 O. S., 259;
The Hardin-Wyandot Lighting Company v. Public Utilities Commission, 118 O. S., 592, 603;
Portsmouth Gas Company v. Public Utilities Commission, 119 O. S., 24;
Columbus Gas & Fuel Company v. Public Utilities Commission, 127 O. S., 109;
City of Houston v. Southwestern Bell Telephone Company, 259 U. S., 318;
Galveston Electric Company v. Galveston, 258 U. S., 388;
Des Moines Gas Company v. City of Des Moines, 238 U. S., 153.

The basic fallacy in the appellant's position is that it attempts to add a separate allowance for going concern value not to evidence of fair value of property considered as junk, disconnected units or without business attached, without earnings or prospects of earnings but to a fair value for a plant in full operation with customers attached and earning money. It must be manifest to the most naive that if the plant of the appellant or any plant were valued as junk, or as property unassembled, or as property without customers attached, without established business, and without earnings, such a value would inevitably be only a fraction of the reproduction cost new less accrued depreciation as estimated in this and other utility rate cases. Manifestly, such a plant would be so lacking in utility that not even the most ardent representative of utility interests could contend that its fair value was anything approaching reproduction cost new of the physical property plus general overheads, materials and supplies, and working capital.

The Decisions of This Court Recognize That No Separate Allowance For Going Value is Either Necessary or Proper in a Case Such as This.

The fact manifestly is that where due consideration is given to reproduction cost new at current prices, less accrued depreciation, plus general overheads, materials and supplies, and working capital, in connection with any other competent testimony, in arriving at the fair present value for rate-making purposes, that utility property has been valued as a going concern with every element of going concern value given all the weight it deserves, and that no separate and additional allowance for going concern value may be made without a manifest duplication. The more recent decisions of this court recognize this fact.

Los Angeles Gas & Electric Corporation v. Railroad Commission of the State of California, 289 U. S., 287, 77 L. Ed., 1180;

Dayton Power & Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 308, 78 L. Ed., 1267, 1280;

Columbus Gas and Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398, 78 L. Ed., 1327;

St. Joseph Stock Yards Co. v. United States of America, 298 U. S., 38, 80 L. Ed., 1033;

In *Columbus Gas and Fuel Co. v. Public Utilities Commission of Ohio,* supra, this court in paragraph 11 of the syllabus held as follows:

> "11. The exclusion of the going value of a gas company's business as an item entering into the rate base is not improper where such value was reflected in other items and particularly in the appraisal of the physical assets as part of an assembled whole."

In the discussion of this topic the court says *(290 U. S., 411, 78 L. Ed., 1335)*:

> "Objection is made also as to the disallowance of a going value for the affiliated companies. Going value was excluded both by court and by commission as an item of property to be separately appraised and separately reported. The record justifies a holding that it was reflected in the other items and particularly in the appraisal of the physical assets as part of an assembled whole. Cf. *Hardin-Wyandot Lighting Co. v. Public Utilities Commission*, 118 Ohio St., 592, 603, 162 N. E., 262. This, we think, was adequate. • • •
>
> "The going value of the Ohio Fuel Gas Company was placed by the appellant's witness at a figure so high ($12,000,000) as to be excessive almost on its face, and the impression of exaggeration is confirmed when the appraisal as a whole is resolved into its elements. • • •
>
> "Other experts, who reject the factor of interest unearned during the period of development, build their estimates of going value upon the cost of attaching new customers to the business, a cost not taken from the books, but merely presumed or estimated at widely variant amounts. So far as such expenses had been actually incurred by any affiliated company, they had already been included as part of the cost of operation. So far as value had been added above the moneys thus expended, there was not even approximate precision in measuring its amount. The burden of building up patronage may be negligible where there is little competition with any other producer or with other kinds of fuel. *Charleston v. Public Serv. Commission*, 110 W. Va., 245, 159 S. E., 38, supra."

The weakness of appellant's contention with respect to going value is brought into bold relief by the complaint

of the appellant expressed time and again in its brief, that the commission in arriving at its tentative value, had allowed the amount of $3,592,040 for going value and that this sum was not allowed in the final value (Cf. *St. Joseph's Stock Yard Co. v. United States*, supra). We have previously explained the nature of the tentative value fixed by the commission. We have pointed out that it is subject to protest after which the final value is found. It is difficult to understand why the company who contends that the evidence established a going concern value of more than twenty million dollars can now argue so earnestly for but three and one-half million dollars for this same item.

The willingness of the company to accept as a proper allowance for going value so small a sum in the face of their original claims challenges the sincerity of their assertions.

(3) Western Electric Prices.

Where the commission in determining the reproduction cost of the property of The Ohio Bell Telephone Company as of June 30, 1925, allowed the full amount contended for by the company as the cost of equipment purchased from Western Electric, with the exception of the increase in price of 10.2% claimed by Western Electric and effective November 1, 1930, the commission has allowed a fair and reasonable price to the company for its purchases from Western Electric and its finding has the approval of the highest courts in the land.

The Ohio Bell Telephone Company purchases substantially all of its telephone equipment from the West-

ern Electric Company. It is, of course, a well known fact that the Western Electric Company and The Ohio Bell Telephone Company are wholly owned subsidiaries of the American Telephone & Telegraph Company and that any transactions between such affiliated subsidiaries are necessarily subjected to a closer scrutiny than would be incurred in the case of non-affiliated corporations.

In determining the reproduction cost of the telephone property of The Ohio Bell Telephone Company one of the very large items, of course, is the cost of equipment to that company. Since substantially all of that equipment is purchased from the Western Electric Company the fairness of the prices charged by Western Electric becomes a matter of great importance. After a careful examination of this whole situation the commission determined that it would not disturb its former findings as to the costs of purchases from Western Electric in determining the present reproduction cost of The Ohio Bell Telephone Company as of June 30, 1925, nor would it disturb the cost of purchases from Western Electric subsequent to that date except as to the price increase of 10.2% as of November 1, 1930. The commission was of the opinion, however, that the price increase effective November 1, 1930, should be disallowed. The company complains of this procedure.

In the decision of *Smith v. Illinois Bell Telephone Company*, 282 U. S., 133, 75 L. Ed., 255, decided December 1, 1930, it was held that:

> "Findings as to the profit made by an affiliated manufacturing company on the sale of equipment to

> a telephone company, and as to the extent to which such profit figures in estimates upon which is predicated the claim that telephone rates fixed by a public utilities commission are confiscatory, are necessary to the determination of such claim."

and that case was remanded to the statutory court for further proceedings in order that the necessary findings might be made upon that particular point.

Pursuant to the mandate of this court in the foregoing case the statutory court in the case of *Illinois Bell Telephone Company v. Gilbert*, 3 Fed. Supp., 595, decided April 29, 1933, found the earnings and profits of the Western Electric Company sales to its Bell customers for each of the years 1916 to 1932, inclusive. These findings were that the earnings on the average investment, less the amount of depreciation reserve account, for the year 1925 was 12.9%; 1926, 10.6%; 1927, 13.6%; 1928, 15.8%; 1929, 11.7%; 1930, 5.8%; 1931, 5.6% and for the year 1932 there was a loss of 3.3%. In considering the very question that is here presented, namely, the disallowance of the price increase of 10.2 claimed by Western Electric and effective November 1, 1930, the statutory court at paragraph 21 of its findings held as follows:

> "In determining reasonable operating expenses to be allowed to plaintiff after November 1, 1930, there should be a reduction of 10 per cent from the prices charged by Western Electric Company on purchases made by plaintiff attributable to maintenance and other expense accounts, and this deduction has been made in determining the amount allowed in these findings on account of plaintiff's operating expenses."

When this decision of the statutory court was in turn presented to this court for review in *Lindheimer v. Illinois Bell Telephone Company*, 292 U. S., 151, 78 L. Ed., 1182, this finding of the statutory court was not disturbed. This court commenting upon this particular subject in the following language:

> "• • • Considering the fact that ninety-nine per cent of the stock of appellee is owned by the American Telephone & Telegraph Company which also owns substantially the same proportion of the stock of the Western Electric Company, we directed that there should be further examination of the purchases made by appellee from the Western Electric Company and of the payments made by appellee to the American Company. As it appeared that the Western Electric Company, through the organization and control of the American Company, was virtually the manufacturing department for the Bell system, we directed specific findings to be made as to the net earnings of the Western Electric Company in that department and as to the extent to which, if at all, such profit figured in the estimates upon which the charge of confiscation was predicated. • • • The court found that the equipment and supplies furnished by the Western Electric Company had been sold to appellee at fair and reasonable prices, and that the earnings of the Western Electric Company on its investment allocated to the business done with appellee, and its profits on sales, had been fair and reasonable, with the exception of an advance in prices of 10.2 per cent. effective on November 1, 1930. That advance the court disapproved, and in determining the reasonable outlays to be allowed to appellee after that date, the court made a reduction of 10 per cent. from the prices charged by the Western Electric Company. Appellee contests this reduction, and appellants object to the amounts allowed. • • •"

Upon the basis of these very recent findings of the highest courts in the land upon the same identical facts which are here presented (Stipulation Chicago case dated December 20, 1932; R., 724) we can find but little merit in the company's contention that the commission erred in refusing to consider the Western Electric price increase of November 1, 1930.

(4) Cost and Reproduction Cost.

The commission in its valuation gave full consideration to both reproduction costs new and the actual cost of the property of the appellant.

Under this heading, the appellant contends that the commission in fixing its final value as of June 30, 1925 did not give proper consideration to reproduction cost new. This contention is wholly without merit and is refuted by the very language of the commission's opinion and finding of January 16, 1934 (R., 195; 248-A). The fact is that the commission from the thousands of pages of testimony and the thousands of exhibits introduced in this record determined the reproduction value, the percent condition and the present value of the property of the appellant as of the date certain (R., 248-A). Because the sum so arrived at is not as great as the appellant contends it should be, and because it is somewhat less than the undepreciated costs carried on the books of the company, the appellant contends that the commission has not given proper consideration to reproduction costs. This argument is obviously without merit.

The fallacy of the appellant's argument is best illustrated by the fact that they have accepted the final valuation as of June 30, 1925 fixed by the commission with the exception of the items of (1) Omitted Land, (2) Going Value and (3) Western Electric Prices these being the only items on valuation now argued by the appellant in this court. Since land was allowed by the commission in the full amount claimed with the exception of those parcels not used and useful and since going value was not established by evidence either competent or of probative value and since Western Electric prices were allowed in full with the exception of the 10% price increase in 1930 it is apparent that appellant's argument as to reproduction cost is not sound.

The argument with respect to appellant's costs is even more fallacious. The books of the company disclose that at June 30, 1925, the fixed capital of the company was $98,712,030 (R., 8170) from which must be deducted the reserve for accrued depreciation amounting to $12,330,763 and reserve for amortization of $229,740 or a total of $12,560,503 and leaving a depreciated book value of $86,151,527. The present value fixed by the commission as of June 30, 1925 was $93,473,774 or $7,322,247 more than the present value as shown by the books of the company.

It is therefore apparent that the commission in fixing a value as of the date certain of $7,322,247 in excess of the depreciated book value must have given full consideration to reproduction cost.

EXISTING DEPRECIATION OR PER CENT CONDITION.

The company does not now challenge the finding of the commission, approved by the court below, to the effect that the property of the company used and useful in rendering telephone service in the state of Ohio was in a percent condition as of the "date certain" of approximately 87%. Inasmuch as this finding of the commission was fully sustained by the evidence and was substantiated by an examination of the financial history of the company and is not now challenged by the company it must be assumed to be correct.

APPELLANT'S VALUATION OFFER.

The appellant concludes its discussion of the subject of valuation with the above heading. (Appellant's Brief, p. 86.) Appellant therein states that on April 15, 1930 before the commission had fixed a tentative or final value, it offered to accept as a fair value for its intrastate property, the sum of approximately $101,000,000. The question naturally arises as to why the company would be willing to voluntarily accept a valuation on its property of more than forty million dollars less than the value testified to by its two valuation witnesses, Williams and Sloan (R., 8161; 7258). Such a proffer cannot fail to create the impression that its claim as to value expressed through its witnesses, was far in excess of what they should have been and seriously challenges the validity of the evidence submitted by the appellant.

THE COMMISSION'S FINDINGS OF VALUE FOR 1926 AND SUBSEQUENT YEARS FOR RATE-MAKING PURPOSES.

Upon the basis of the thousands of pages of testimony and the thousands of exhibits which were introduced into the record of this case, the commission determined that the fair present value of the intrastate property of The Ohio Bell Telephone Company devoted to the public service as of June 30, 1925, was $93,707,488. This finding of the commission was made on January 16, 1934, approximately nine years after the "date certain" of June 30, 1925. It was therefore necessary for the commission to ascertain by some appropriate method the fair value of the company's property for each of the years succeeding 1925. Using the valuation of June 30, 1925, as the basic value, the commission computed the value for each succeeding year by determining from evidence available to it, the fair value for each succeeding year beginning with the year 1926 and concluding with the year 1933, adding to the results so obtained for each year the net additions made by the company in the full amount thereof, so that the fair value of each of the years might be accurately portrayed. The method followed by the commission was a fair and reasonable one and was the only practicable method by which the fair value of the company's property for the years succeeding 1925 could be ascertained.

For the purpose of ascertaining the valuation of a public utility's property for rate-making purposes a "date certain" is selected as the date upon which such valuation shall be predicated and the evidence intro-

duced in the case for the purpose of determining fair value is based upon prices existing at the "date certain."

It has been pointed out heretofore that the "date certain" in this particular case was June 30, 1925, and to establish the value of the property of The Ohio Bell Telephone Company as of that date thousands of pages of oral testimony were introduced before the commission together with thousands of exhibits, all relating to the reproductive value of the company's property as of the "date certain". Upon the basis of the voluminous evidence so produced the commission found the fair present value of the intrastate portion of the property of The Ohio Bell Telephone Company for rate-making purposes as of June 30, 1925, to be $93,707,488. (R., 195.) Had this finding been made in 1925 the excessive earnings accruing to the company up to that time would have been ordered refunded to the telephone subscribers entitled thereto and the rates of the company then in effect would have been ordered reduced for the future in accordance with the commission's finding of fair value.

However, the commission, due to the tremendous volume of testimony that was introduced in this case and the many delays that were incurred and which were entirely beyond the commission's control, did not issue its finding and order in this matter until January 16, 1934, or almost nine years after the "date certain." If the commission had limited its findings to the "date certain" it would have been forced to hold that the earnings of the company under its then existing rates were excessive and the company would have been compelled to place

in effect a schedule of rates which for the succeeding years might have been unfair to it in the light of the changing value of the company's property in those years. The commission, recognizing that the company in the nine years that had intervened since the "date certain" had made many additions to its property thereby increasing the value of it, was of the opinion that by some appropriate method it should arrive at a valuation for each of the subsequent years for the purpose of ascertaining whether or not the company had earned excessive rates in the succeeding years and the amount thereof for each year involved. It, therefore, examined the evidence which had been introduced in the case as to the additions made by the company during the period subsequent to June 30, 1925, together with the retirements for the purpose of ascertaining the value of the property in each of the years succeeding June 30, 1925. Had the commission's examination stopped at this point the result would have been that to the valuation of June 30, 1925, would have been added the cost of the additions, less retirements, for each of the succeeding years and the result so arrived at would not have represented the fair value of the property for they probably would not have reflected either an increase or decrease in the basic price level of the original valuation or additions for any one year. The commission was confronted, therefore, with the problem of determining the value of the property in the succeeding years by some proper method which would be fair both to the company and its subscribers, and which at the same time would not necessitate a new valuation proceeding for each of the years involved. It should be obvious to any unbiased person that an attempt to fix the value for the succeeding years by the introduction of testimony

similar to that introduced for the purpose of determining the value as of the "date certain" was a practical impossibility and that if such a procedure were followed by any administrative commission the determination of the fair value of a public utility's property for the purpose of rate-making would never be concluded.

The commission, therefore, determined that the only practicable method of ascertaining the fair value of the company's property for each of the years succeeding 1925 was by ascertaining that value upon the basis of the evidence that was available to it for the purpose of determining the fair value of the company's property in each of the years involved, adding to the results so obtained all the net additions made by the company at 100% thereof. By this method, the following valuations of the company's intrastate property were arrived at:

Date	(1) Depreciated Book Cost	(2) Commission's Present Value	Excess Col. 1 Over Col. 2	Excess Col. 2 Over Col. 1
June 30, 1925	$ 86,591,399	$ 93,707,488		$7,116,089
June 30, 1926	95,232,903	101,767,774		6,534,871
June 30, 1927	106,542,570	111,036,522		4,493,952
June 30, 1928	119,156,193	122,417,735		3,261,542
June 30, 1929	129,549,781	135,765,576		6,215,795
June 30, 1930	140,587,783	145,683,047		5,095,264
June 30, 1931	145,530,783	145,271,663	$ 259,120	
June 30, 1932	144,658,320	133,625,655	11,032,665	
June 30, 1933	141,594,996	126,250,206	15,344,790	
Totals			$26,636,575	$32,717,513

The above analysis shows that during the eight-year period from June 30, 1925, to June 30, 1933, the present value assigned by the Commission exceeded book value by $32,717,513 during five years and was less than book value by $26,636,575 during the other three years. The net difference, $6,080,938, over a period of eight years would be the equivalent of $760,117 per year in excess of the company's actual investment in its property.

The company now insists that this method as used by the commission was erroneous; that it was denied a fair trial, and that its property has been confiscated. The finding of the commission in this connection is perhaps best expressed in the commission's own language (commission's opinion of January 16, 1934, R., 187-9). We quote, therefore, from that opinion:

"**Price Trends.**

"When we examine the condition of the company's property, both as to value and income, subsequent to June 30, 1925, we must take into consideration not only the net additions, but also changed conditions and price trends, that we may determine whether the rate, fixed at the day certain, produces a revenue sufficient to afford the company a just return for a reasonable time in the immediate future.

In the case of the *Central Kentucky Natural Gas Company, Appellant, v. Railroad Commission of Kentucky, supra,* the Supreme Court, in discussing the refusal of the court below to take into account the effect of changed conditions said:

'That restriction also necessarily excluded from consideration the profound changes in values, costs of service, consumption of commodity and reasonable return on invested capital which we judicially know took place during the period of more than five years, while the case was pending before the commission and the court.'

In numerous cases, courts have indicated that they may take judicial cognizance of the downward trend of prices during the years of the depression. We feel that the commission may likewise take notice of such fact. If we did not do so, it might well happen that a rate fixed for 1925 upon the then value of the property would subsequently be inadequate to afford a just return if the additions and betterments were

considered and price trends disregarded, but that this same rate would be sufficient over that term of years when due consideration is given to price trends decreasing the value of the property upon which the return must be earned. Sections 499-11 and 499-15 G. C., provide the method of ascertaining the facts. The commission may resort to any information available to keep itself informed of extensions and improvements and other changes in the value of the property.

We have endeavored from such sources of information as are available to correctly measure the price trends of telephone property including accounts 211 to 265, since the day certain. A study was made of the cost prices furnished by manufacturers of telephone equipment over the several years. The trend of land valuation was ascertained from examination of the tax value in communities where the company had its largest real estate holdings, confining such to urban property only. For building trends resort was had to prices indices of the Engineering News Record, a recognized magazine in the field of engineering construction. Labor trends were developed from the same sources. Resort was also had to the finding of the statutory court in the Chicago case and its study of price level of sales of the Western Electric Company. That court was there dealing with December 31, 1920, as the date certain and considered the level of that date as 100%, whereas we are dealing with a price level subsequent to June 30, 1925. The trend in price for each year as compared to the preceding years, indicated in the Chicago decision, taking the level of December 31, 1920, as 100%; was 1921,—1.7%; 1922, 1926,—8.7%; 1927,—4.9%; 1928,—10.3%; 1929,—8.6%.

In the Chicago case, the court disallowed the advance of 10.2% in Western Electric prices as of November 1, 1930, but held that plaintiff was entitled to a maintenance of the 1930 price level during

the years 1930, 1931 and 1932. In harmony with the decision of this court, we hold that the price for 1931 and 1932 for Western Electric should not be increased.

It would appear that the Chicago court in fixing its price trend considered only the price trend of the Western Electric purchases, probably on the assumption that it was a correct index of the price trend of all telephone property. We, however, have thought it pertinent, as above indicated, to secure price trends of telephone properties from the sources we have indicated in addition to the price trend of the Western Electric which we have applied to equipment sold by that company. We are conscious that there may be some errors in this computation of price trends, but we feel that we are well within the line of safety in that we have considered only price trends as affecting telephone property, and that such trends are largely built upon the prices of the Western Electric which have not declined to the extent of general commodity prices.

Taking the date certain, June 30, 1925, as 100% and considering the added equipment for each year as 100% as of the year of installation, our examination develops a composite trend applicable to the entire property, exclusive of right of way and working capital, as of the beginning of the respective years and related to the preceding year as follows: 1926, 98.73%; 1927, 96.97%; 1928, 99.20%; 1929, 101.45%; 1930, 95.65%; 1931, 93.95%; 1932, 88.71%, and 1933, 102.96%. The figures supporting these percentages are too numerous to set out in detail but the manner in which the percentages have been applied to the value of the property for each year is shown in Appendix 'B'.

An interesting discussion of price trends will be found *In re Chesapeake and Potomac Telephone Company*, decided by The Public Service Commission of Maryland, November 28, 1933. This com-

mission considered numerous indices in arriving at its conclusion as to the price trend for the telephone company and exhibits a graph of various price trends and the composite trend arrived at.

When we plot the price trends found by us and compare our graph with that of the Maryland commission and the graph of the price trends by the Chesapeake Company, we find that all are practically parallel until 1930. After that date our graph parallels that of the Maryland commission, but indicates values practically an average of those claimed by the telephone company and found by the Maryland commission.

The graph exhibited in the Maryland commission's decision does not cover the year 1933. During 1933, we find an upward trend in both as to labor and material but a downward trend as to land value, the average of all property indicating a slight upward trend. (See graph, Appendix 'N'.)''

The Contention of Appellant That the Values Fixed by the Commission For 1926 and Thereafter Were Not Based on Evidence.

The appellant rests its entire case on this subject upon the contention that the values fixed by the commission for 1926 and the succeeding years were based on information withheld from appellant and not offered or introduced in evidence. It strenuously endeavors to apply the principles laid down by this court with respect to the use of price trends in fixing values in the case of *West v. Chesapeake & Potomac Telephone Company of Baltimore City*, 295 U. S., 662; 79 L. Ed., 1640 to this case, but a careful examination of the facts of the two cases will indicate that they have essential points of difference,

and that the law enunciated by this court in the West Case is not applicable to the case at bar. In the first place, no reproductive valuation upon the basis of an inventory and appraisal as of the date certain was made in the West case. In the second place, the price indices relied upon in the West case were not based upon price indices of telephone property, but were arrived at by a complex application of commodity indices. In this case the commission specifically said "• • • we have considered only price trends as affecting telephone property, and that such trends are largely built upon the prices of Western Electric which have not declined to the extent of general commodity prices." (R., 188.) Surely the appellant when it refers to 'secret information' (appellant's brief p. 16) and 'information withheld from appellant' (appellant's brief p. 25) does not refer to the prices of Western Electric upon which the commission says it largely built its price trends, (R., 188) for it must be apparent even to the uninitiated that the findings of the statutory court in the Chicago case in this connection were a matter of public record and that a large part of the record in that case was stipulated into the record of this case. (R., 724.) In the third place, the company in the West case introduced testimony both before the commission and in the federal court as to its reproductive value in all of the years involved. No such evidence was introduced by the company or proferred by the company in this case.

It must constantly be remembered that the commission, in the case at bar, in determining the value of the

company's property for the years succeeding 1925, attempted to measure that value by applying price indices of telephone property to the value determined by it from actual testimony as of the date certain plus net additions. (R., 187-9.) It must also be remembered that the commission had before it for that purpose the voluminous record produced in this case plus that portion of the record in the Chicago case included by stipulation. (R., 724.) in which there is evidence as to the value of telephone property for the period involved. It should also be borne in mind that the commission had available to it the finding of the statutory court in the Chicago case and its study of the price level of sales of the Western Electric Company and that the commission based its findings of value "largely • • • upon the prices of Western Electric which have not declined to the extent of general commodity prices". (R., 188.)

Appellant argues that it first learned of the commission's use of price trends in fixing values for the years 1926 and thereafter, when the order of January 16, 1934, was announced (appellant's brief, p. 26). Surely the appellant knew throughout this proceeding that some such basis of determining the fair value of its property for the years in question would have to be used by the commission if this case were ever to be concluded. *(Cf. Northwest Bell Telephone Company v. Nebraska State Railway Commission*, 297 U. S. 471; 80 L. Ed. 810.)

Appellant also agrues that after the commission had issued its finding and order of January 16, 1934, fixing the value of its property as of the date certain and for

each year thereafter through the year 1933, it requested of the commission an opportunity to examine, analyze, explain and rebut the information considered by the commission in arriving at its findings, (R., 256-273; 312-383) but the appellant at no time proferred any testimony to show that the results obtained by the commission were erroneous or that they resulted in the confiscation of the company's property. In other words, the commission having issued its finding and order adversely to the company, upon the basis of the thousands of pages of testimony and thousands of exhibits introduced in this record, and upon the basis of information that the commission as a regulatory body must be conceded to have available to it the company without offering to show wherein the results obtained were in error insisted upon the opportunity to examine, analyze, explain and rebut the findings of the administrative body.

The burden of sustaining the increased rates sought by the company was upon the company throughout this proceeding. It failed to sustain that burden.

The company lays great stress upon the assertion that the findings of the commission were not based upon evidence in the record and in fact were based upon secret information; they quote from the dissenting opinion of the chairman of the commission to the effect that the cost trends applied did not reflect telephone construction costs, and that they were derived from trade magazines and other publications, not in evidence. This statement in the dissenting opinion is at variance with the findings of the majority of the commission, which specifically

said that the cost trends applied were derived from telephone property and specifically sets forth the sources of its information. (R., 187-9.) Cf. *Baltimore and Ohio Railroad Company et al. v. United States of America et al.*, 298 U. S., 349; 80 L. Ed., 1209.

That there was evidence in the record upon which the commission could predicate its findings as to value for the years 1926 and thereafter, we believe, is amply demonstrated.

The evidence as to Western Electric prices for almost the same period of time was fully set forth in the Chicago case with which this court is familiar. *(Lindheimer v. Illinois Bell Telephone Company,* supra.) A large portion of that evidence was stipulated into the record of this case. (R., 724.) The findings of the statutory court with respect to Western Electric Company prices for telephone apparatus *(Illinois Bell Telephone Company v. Gilbert*, 3 Fed. Supp., 595) was a matter of public record known both to the commission and the company. (Appellant's brief, page 26.) That it was upon this evidence that the commission largely built its prices for the telephone property of the appellant for the years 1926 through 1933 is best illustrated by the commission's own language:

> "It would appear that the Chicago court in fixing its price trend considered only the price trend of Western Electric purchases, probably on the assumption that it was a correct index of the price trend of all telephone property. We, however, have thought it pertinent, as above indicated, to secure price trends of telephone properties from the sources we have indicated in addition to the price trend of the West-

ern Electric which we have applied to equipment sold by that company. We are conscious that there may be some errors in this computation of price trends, but we feel we are well within the line of safety in that we have considered only price trends as affecting telephone property, and that such trends are largely built upon the prices of Western Electric which have not declined to the extent of general commodity prices."

And the soundness of the commission's findings can be mathematically demonstrated by comparing the price trend percentages thus arrived at with those found in the Chicago case.

COMPARISON PRICE TRENDS ADOPTED BY STATUTORY COURT IN CHICAGO CASE AND THOSE ADOPTED BY OHIO COMMISSION.

(Chicago Case.) "It appears from the evidence that taking the price level of December 31, 1920, as one hundred percent, the annual changes in price level of sales by Western Electric Company to plaintiff, were as follows: 1921, —1.7%; 1922, —10.7%; 1923, +0.2%; 1924, —5.6%; 1925, —1.1%; 1926, —8.7%; 1927, —4.9%; 1928, —10.3%; 1929, —8.6%.

"The price level at the end of 1929, was 58.3% of that of December 31, 1920. . . ." Illinois Bell Telephone Company v. Gilbert, 3 Fed. Supp., 595.

Application of Above Price Levels in Illinois Bell Case.

Period Applied	*Net change during each period*	*% Current Yr to 12-31-20*
December 31, 1920—Basic Date		100.0%
Year 1921	— 1.7% of 100.0% = — 1.7%	98.3%
Year 1922	—10.7% of 98.3% = —10.5%	87.8%
Year 1923	+ 0.2% of 87.8% = + 0.2%	88.0%
Year 1924	— 5.6% of 88.0% = — 5.0%	83.0%
Year 1925	— 1.1% of 83.0% = — 0.9%	82.1%
Year 1926	— 8.7% of 82.1% = — 7.2%	74.9%
Year 1927	— 4.9% of 74.9% = — 3.7%	71.2%
Year 1928	—10.3% of 71.2% = — 7.4%	63.8%
Year 1929	— 8.6% of 63.8% = — 5.5%	58.3%

Application of Price Levels in Illinois Bell Case to Corresponding Periods Covered by Ohio Bell Case.

Period Covered	*Net change during each period*	*% Current Yr. to 6-30-25*
June 30, 1925—Basic Date		100.0%
Year 1926	— 8.7% of 100.0% = — 8.7%	91.3%
Year 1927	— 4.9% of 91.3% = — 4.6%	86.8%
Year 1928	—10.3% of 86.8% = — 8.9%	77.9%
Year 1929	— 8.6% of 77.9% = — 6.7%	71.2%

Per Cent Each Current Period to Preceeding Current Period Based on Illinois Bell Case, Used by Commission in Ohio Bell Case.

						Excess of Ohio Bell Over Illinois Bell Price Levels
			6 Mos.	1925	100.00%	
91.3%	: 100.0% =	91.3%	Year	1926	98.73%	7.43%
86.8%	: 91.3% =	95.1%	Year	1927	96.97%	1.87%
77.9%	: 86.8% =	89.7%	Year	1928	99.20%	9.50%
71.2%	: 77.9% =	91.4%	Year	1929	101.45%	10.05%
			Year	1930	95.65%	
			Year	1931	93.95%	
			Year	1932	88.71%	
			Year	1933	102.96%	

But appellant objects that other "undisclosed information" was used by the commission and refers to the statement made by the commission to the effect that "a study was made of the cost prices furnished by manufacturers of telephone equipment over the several years". (R., 188.)

Of course the largest manufacturer of telephone equipment is Western Electric. In 1932 Edgar S. Bloom was president of Western Electric and had been since 1926. (R., 3941; 5017.) In addition he was a director or officer in most of the affiliated Bell enterprises. (R., 5017.) For that reason his testimony as to the prices of telephone

equipment is particularly pertinent. Mr. Bloom made a study of Western Electric costs and prices for the period from 1921-30 and stated that he had selected that period as one in which prices were declining. (R., 3977.) In a letter to telephone company presidents (Ex. X433, R., 9249-10) written on August 26, 1927, Mr. Bloom in his capacity as president of Western Electric called attention to the fact that prices on approximately 50 classes of telephone apparatus would be reduced effective September 1, 1927. The per cent price reduction ranging from 3 to 28%. Mr. Bloom pointed out that price reductions made during the years 1926 and 1927 (the first two years after the date certain in this case) would aggregate $20,000,000, annually, on the present volume of purchases. He pointed out that additional reductions in the cost of installation work had been accomplished and that through the cooperation of the operating companies other costs had been appreciably reduced. He gave his opinion that these savings would total $6,000,000 in addition to the $20,000,000 already referred to and would all told amount to a reduction of 13% on annual sales of Western Electric to the Bell companies. (R., 9250.)

On October 17, 1930, Mr. Bloom wrote another letter. (Ex. X434, R., 9250.) This communication was addressed to Mr. Frederick H. Reid, president Mountain States Telephone and Telegraph Company, Denver, Colorado. In this letter Mr. Bloom stated that for the years 1926-1929 many important reductions had been made in prices for the products and charges for the services of Western Electric to the associated companies. He stated that

"price reductions made since the beginning of 1926 have resulted in an annual saving to the associated companies of approximately $100,000,000 based on their present volume of purchases. This means that, at January 1, 1926, prices, the associated companies would have paid over 25% more for their 1930 purchases than the actual billing rendered." After pointing out that the depression would necessitate some increase in prices Mr. Bloom said "our present price level on telephone apparatus and equipment is about 72% of the January 1, 1926, level. With the readjustments effective November 1, 1930, the level will be about 79%, or 21% lower than at January 1, 1926."

Now Mr. Bloom's testimony was neither "secret" nor "undisclosed". As president of the largest manufacturer of telephone equipment in the world he was well qualified to testify on the prices of that equipment and he testified to reductions in cost prices of telephone equipment which if strictly applied by the commission would have resulted in lower valuations for appellants property for the years 1926-1933 than those fixed by the commission. For example Mr. Bloom stated that for the years 1926 and 1927 prices were reduced 13%—yet for 1926 the commission's valuation was 98.7% of the final value at June 30, 1925 (Appellant's Brief, page 8) and for 1927 it was 95.7% of the final value at June 30, 1925. (Appellant's Brief, page 8.) Mr. Bloom pointed out further reductions in 1928, 1929 and 1930 so that in October of 1930 prices were only 72% of the January 1, 1926 level. Yet the commission's value for 1928 was 95% of

the 1925 valuation, for 1929 it was 96.3% of the 1925 valuation, and for 1930 it was 92.2% of the 1925 valuation.

Furthermore in the 8½ years from the date certain through 1933 net additions to the property of the company totaling $68,743,044 (Wood Ex. 2, R., 8172) were allowed and throughout the 8½ year period these net additions were treated as being in 100 per cent condition and nothing was deducted for the accrued depreciation which necessarily would be present. This is but another instance of the liberality of the commission.

Bloom was not the only witness that introduced evidence into the record of this case as to the cost of telephone equipment in the period involved. Richard H. Gregory, comptroller of Western Electric, also introduced evidence on this subject. The following data is taken from Exhibit X-13A, Statement B, R., 8966—

EXHIBIT X-13A.

Statement B.

Estimated Effect of Price Changes on Apparatus and Equipment Sold to Bell Telephone Company, 1921-1930.

	Tel. Apparatus Sales at Preceding Year's Dec. 31st Prices	Effect of Price Change Made Each Year (Annual Basis)	% Price Change (Annual Basis)	Price Level At End of Year
12/31/20	.....	.....	.....	100.0
1921	$70,015,000	(—$1,200,000)	(— 1.7)	98.3
1922	82,010,000	(— 8,800,000)	(—10.7)	87.8
1923	86,450,000	+ 200,000	+ 0.2	88.0
1924	109,670,000	(— 6,100,000)	(— 5.6)	83.0
1925	97,690,000	(— 1,100,000)	(— 1.1)	82.1
1926	107,870,000	(— 9,400,000)	(— 8.7)	75.0
1927	101,740,000	(— 5,000,000)	(— 4.9)	71.3
1928	112,240,000	(—11,500,000)	(—10.3)	64.0
1929	145,980,000	(—12,500,000)	(— 8.6)	58.5
1930	140,690,000	+14,400,000	+10.2	64.4

		Effect in 1930 of 1930 Changes	Average Increase Actually Effective in 1930	Average 1930 Price Level
1930 Sales at Average 1930 Prices	$143,040,000	$2,350,000	+1.7	59.5
1930 Sales at Average 1930 Prices	.....	.....	.....	$143,040,000
1930 Sales at 12/31/30 Prices	.....	143,040,000	.....	240,605,000
		595		

Cumulative effect of Price Changes since 12/31/30 in 1930 Volume 97,565,000

RAL :ID, 1/14/32

Note: The above is a complete copy of a table (Statement B) included in the supporting data and working papers made available on January 15 in response to my letter of January 11 to Mr. Gregory in reference to Statement A bearing the same title but on a non-cumulative basis.

EEH

Numerous other exhibits reflecting the trend of prices on telephone equipment are found in the record. A few of these include Exhibit X-14, R., 8967—Price Indices of Copper and Lead, wholesale prices, (R., 8968) Metal and Metal Products and Building Materials (R., 8969); Exhibit D-81, R., 8930, Cost of Copper Bar and Lead Purchased by Manufacturing Department 1918-1931; Exhibit D-1, R., 8948D—Prices of Transmitters, Receivers and Induction Coils sold to Bell from January 1, 1926, to December 31, 1930. These and other exhibits all reflected the change in price levels after 1925 to a far greater degree than found by the commission. And yet appellant contends that the findings of the commission as to value during the period from 1926-1933 was based on undisclosed information and that its property

is being confiscated without at any time showing wherein the values fixed by the commission are in error.

At page 30 of its brief appellant states that its "evidence was rejected". This cannot be so for none was offered. What appellant means is that having spent ten years on a state wide inquiry for the purpose of ascertaining the justness of its rates it wanted to go back and go through the whole procedure again on the basis of its separate exchanges on the theory that it had insisted upon offering separate testimony as to each exchange while going along all the while in the state wide case and introducing its testimony on that basis. The inference in appellant's brief is that it had offered evidence as to value for the years 1926-1933 and that this evidence was rejected. This is not the fact.

That the company's property is not being confiscated is self-evident. That it has not been deprived of its property without due process is apparent. For twelve years it prosecuted its case before the commission. The record so made consists of thousands of pages of testimony and thousands of exhibits relating to the fair value of the property of the company devoted to the furnishing of telephone service in the state of Ohio and to other pertinent matters concerning the justness of the rates to be charged for that service. On the basis of that evidence, the commission reached its decision as to the rates properly chargeable by the appellant for its telephone service over the period involved. Its conclusions are supported by evidence and did not result in confiscation of appellant's property.

The fact is that the primary attack made by the appellant on the findings of the commission is directed at the method used by the commission rather than at the results obtained. The burden of appellant's complaint as to lack of due process resting in the allegation that the commission did not advise it as to the precise weight given to the various phases of the evidence with respect to the value of appellant's property for the years 1926 to 1933 inclusive, and did not inform the appellant as to the mental operations by which its decision was reached. This court, as recently as May 18, 1936, has said with respect to the interstate commerce commission:

> "***There is no requirement that the commission specify the weight given to any item of evidence or fact, or disclose mental operations by which its decisions are reached. Useful precision in respect of either would be impossible. And it would be futile upon the record to attempt definitely to ascertain the weight assigned to any fact or argument in prescribing the divisions. ***" *Baltimore & Ohio Railroad Company et al. v. United States of America et al.*, 298 U. S. 349, 359; 80 L. Ed., 1209, 1219.

Any careful examination of the facts will show that in fixing the value of appellant's property for the period from 1926 through 1933 that the commission acted neither capriciously or arbitrarily but upon the basis of the evidence available to it and if the results so obtained by the commission are checked against the evidence available and in the light of judicially recognizable facts, the accuracy of the commission's conclusions is further emphasized.

It has previously been pointed out that the commission had available to it in this case the findings of the Statutory Court *(Illinois Bell Telephone Company v. Gilbert supra)* in respect of Western Electric prices for telephone apparatus in addition to other evidence relating to the value of telephone property during the period involved. It has also been established by the language of the commission's own opinion that it relied largely upon the price levels so developed in connection with Western Electric for the purpose of computing the price levels applicable to the property of the appellant and the results so obtained were checked against other information available to the commission for the purpose of determining their accuracy. It has been demonstrated that the price levels applied by the commission to the property of the appellant were considerably higher than the price levels applied by the Statutory Court in the *Gilbert case supra*, with respect to this same type of property. In spite of all this, the appellant contends that it has been deprived of its property without due process of law because it disapproves of the method followed by the commission.

This court and other courts have fully recognized the difficulties encountered by administrative commissions in the fixing of values for vast utility properties year by year in a period of fluctuating price levels and this court and other courts have recognized that the values of such properties cannot be obtained with absolute accuracy and that some reasonable estimate in many cases will be necessary. In *Illinois Bell Telephone Company v. Gil-*

bert et al, supra, the Statutory Court was concerned with the valuation of the property of the Illinois Bell Telephone Company over a period comparable to the one involved in this case. In that case, the fair value of the company's property for the years, 1923 through 1930, was determined by the court upon the basis of an estimate made by the company's engineers as to the cost of reproducing the company's property. These estimates were based in a large degree on Western Electric prices. By this method, definite values were allocated to the property for each of the years, 1923 through 1930. However, no such definite findings of value were made for the years, 1931 and 1932. In commenting upon the valuation for the two years, 1931 and 1932 the court said (p. 601):

> "The valuation of plaintiff's property for 1931 and 1932 presents some difficulties which are not present in the other years. We are obliged to take notice of the general decline of the property values which has accompanied the present period of business stagnation. For this reason we cannot take the reproduction estimates based on the cost of labor and material stated in the record at their face. We have fixed values therefore for 1931 and 1932 which in our opinion give due consideration to the element of the present general decline in values."

By this method, the Statutory Court found that the value of the Illinois Bell Telephone Company's property in the case there involved for 1931 was $197,500,000 or $7,500,000 less than the value fixed for the same property for the year 1930. And for 1932 the court found that the value of the property involved was $185,000,000 or $20,000,000 less than the value fixed for the year 1930.

This finding of the Statutory Court met with the approval of this court when that case came to this court for review in *Lindheimer v. Illinois Bell Telephone Company*, 292 U. S. 150; 78 L. Ed., 1182, this court commenting on the findings of the District Court in the following language: *(292 U. S., 158; 78 L. Ed., 1188.)*

> "The District Court found that the method adopted by appellee's witness in ascertaining the cost of reproduction new was reliable and that appellee's estimates were substantially correct. The court encountered difficulties in making its valuations for the years, 1931 and 1932. It took notice of the general fall in values which had accompanied the depression in business. And for that reason, the court fixed values for 1931 and 1932 which in its opinion 'gave due consideration to the element of the present decline' ".

In *Central Kentucky Natural Gas Company v. Railroad Commission of Kentucky*, 290 U. S. 264; 78 L. Ed., 307, this court in paragraph 9 of the syllabus said:

> "Judicial notice may be taken of changes in values, cost of service, consumption of commodities and reasonable return on invested capital which have taken place during the period while a case was pending before the utilities commission and the court."

In that case the period involved was from December 31, 1926 to September, 1932, a period almost identical with the one involved in this case and it is to this period that the court refers when it discusses: *(290 U. S., 274; 78 L. Ed., 314.)*

> "• • • the profound changes in values, costs of service, consumption of commodities and reasonable return on invested capital. • • • "

This principle so announced was a reiteration of the principle previously followed by this court in *Atchison, Topeka, & Santa Fe Railway Company et al. v. United States,* 284 U. S., 248; 76 L. Ed., 273, and subsequently approved in *Dayton Power & Light Company v. Public Utilities Commission of Ohio,* 292 U. S., 290; 78 L. Ed., 1267.

Too much emphasis cannot be placed upon the fact that in the case at bar the attack of the appellant is centered upon the method used by the commission in arriving at the value of appellant's property for the years, 1926 through 1933. Little is said with respect to the results obtained and in this connection the decisions of this court in several recent cases are pertinent.

In *Los Angeles Gas & Electric Corporation v. Railroad Commission of the State of California,* 289 U. S., 287; 77 L. Ed., 1180, this court in paragraph 1 of the syllabus says:

> "In a suit involving the validity of rates fixed by a state public service commission, the Supreme Court of the United States does not sit as a board of revision, but to enforce constitutional rights, and is not concerned either with the method used in reaching the determination except as it may have a definite bearing on the validity of the result reached, or in the determination itself, so long as constitutional limitations are not transgressed."

And in its opinion in this case, the court in discussing this particular question says *(289 U. S., 304; 77 L. Ed., 1192):*

> "• • • We have emphasized the distinctive function of the court. We do not sit as a board of re-

vision, but to enforce constitutional rights. * * * The legislative discretion implied in the ratemaking power necessarily extends to the entire legislative process, embracing the method used in reaching the legislative determination as well as that determination itself. We are not concerned with either, so long as constitutional limitations are not transgressed. * * * "

This principle was restated in the recent case of *St. Joseph Stock Yards Company v. United States of America*, 298 U. S., 38; 80 L. Ed., 1033, wherein this court said *(298 U. S., 51; 80 L. Ed., 1041)*:

" * * * The court does not sit as a board of revision to substitute its judgment for that of the legislature or its agents as to matters within the province of either. * * * When the Legislature itself acts within the broad field of Legislative discretion, its determinations are conclusive. When the Legislature appoints an agent to act within the sphere of legislative authority, it may endow the agent with power to make findings of fact which are conclusive, provided the requirements of due process which are specially applicable to such an agency are met, as in according a fair hearing and acting upon evidence and not arbitrarily. * * * In such cases, the judicial inquiry into the facts goes no further than to ascertain whether there is evidence to support the findings, and the question of the weight of the evidence in determining issues of fact lies with the legislative agency acting within its statutory authority."

And in *Baltimore & Ohio Railroad Company v. United States of America*, 298 U. S., 349; 80 L. Ed., 1209, this

court held that the findings of the Interstate Commerce Commission: *(298 U. S., 362; 80 L. Ed., 1221.)*

> " • • • Based on evidence and its determination as to the significance to pertinent facts found are conclusive. • • • "

In conclusion, it must constantly be borne in mind that while the appellant vigorously contends that the finding of the commission with respect to the value of its property is confiscatory, the appellant has offered no evidence to establish that fact, and that the established rule of this court is that one claiming that a rate established by a public authority is confiscatory has the burden of showing it to be such, and that this court will not interfere with the exercise of the rate making power unless confiscation is clearly established. *St. Joseph Stock Yards Company v. United States of America, supra; Dayton Power and Light Company v. Public Utilities Commission of Ohio, supra.*

II.

OPERATING EXPENSES.

The importance of determining the proper amount to be allowed as operating expenses has been recognized by this court in the recent case of *Lindheimer v. Illinois Bell Telephone Company*, 292 U. S., 151, 78 L. Ed., 1182 (1934), where it held in paragraph 3 of the syllabus:

> "3. Charges to operating expenses may be as important as valuations of property in determining

whether a public service commission's order establishing rates for telephone service is confiscatory."

Discussing this topic in the opinion, Mr. Chief Justice Hughes speaking for the court says (p. 164):

> "Operating expenses. In determining the effect of these reductions, and what amounts would still be available to the company for net return, we come to the questions raised by the company's charges to operating expenses. Charges to operating expenses may be as important as valuations of property. Thus, excessive charges of $1,500,000 to operating expenses would be the equivalent of 6% on $25,000,000 in a rate base. In this instance, against the reductions which the rate in suit would have effected, are the considerable sums which would be added to the amounts available for return by the adjustments in operating expense made by the District Court • • •".

With the exception of the amounts claimed by the company for the expense of depreciation, license contracts costs and Western Electric purchases chargeable to expense, the commission allowed without question all of the operating expenses contended for by the company. The subject of Western Electric prices has been heretofore discussed in this brief at pages 43-47, supra. We shall therefore turn our attention to the other two items wherein differences existed in the operating expenses as contended for by the company and as allowed by the commission.

DEPRECIATION.

The rates of depreciation prescribed by the commission are equitable and sufficient to permit the company to make normal replacements of property due to wear and tear, obsolescence and inadequacy and to maintain the physical plant in a high state of efficiency.

Before discussing the company's brief in regard to depreciation, it is perhaps appropriate to state definitely the ruling of the commission with respect to this item. It found (R., 203) that "• • • a composite rate of 4% of the depreciable property is a fair and just allowance to be made annually for depreciation expense, and it is our conclusion and finding that said rate be fixed and allowed in this case to be computed on the present value of the depreciable property as of the date certain, and for years subsequent to the year 1925 to be computed upon the present value of said property as of the date certain plus net additions to the depreciable property • • •."

COMMISSION DURING ITS STUDY OF DEPRECIATION HAD TWELVE AND ONE-FOURTH YEARS OF COMPANY'S REPLACEMENT EXPERIENCE BEFORE IT.

At the time the commission determined the depreciation rate (1934) it had in evidence a great mass of data submited by appellant dealing with plant costs, additions, replacements, salvage recovery, depreciation charged each year beginning with the organization of the

company in 1921—in all a period of twelve and one-fourth years. Its problem was to fix a rate beginning with the date certain (June 30, 1925). Obviously it was in the unique position of being able to test the reasonableness of the charges actually made during the period under review. It was not forced, as are rate-fixing tribunals in most cases, to accept highly speculative and conjectural opinions of engineers and alleged experts as to the factors of wear and tear, obsolescence and inadequacy. It had facts to examine and did not resort to speculation. It proceeded upon the principle stated in *West Ohio Gas Company v. Public Utilities Commission of Ohio* (294 U. S., 79, 82, 79 L. Ed., 773, 776) that prophecy cannot be resorted to when proof is available. In other words, the commission in 1933 was assured that the depreciation rate prescribed would have been adequate to provide for the replacement of units abandoned since June 30, 1925, and, in addition, enable the company to maintain an adequate reserve for the retirement of property still in service.

ACCOUNTING METHODS OF PREDECESSOR COMPANIES NOT UNIFORM BUT ASSETS TAKEN OVER BY OHIO BELL TELEPHONE COMPANY AT BOOK VALUE.

One of the facts of fundamental importance in this entire case is that The Ohio Bell Telephone Company was organized and began business in 1921 not as a new enterprise with new capital facilities but as a consolidation

of several telephone utilities in all types of condition. Some were very old with property badly depreciated. Some operated competitively and were atracted to the consolidation by the possibilities of a unified service with higher rates and lower costs of operation. The details of the history of the organization of the present company are to be found in Hagenah Exhibit 1 (R., pp. 6541-6552). In this exhibit it is ascertained that, regardless of age, The Ohio Bell Telephone Company recorded these properties in its accounting records at the book values as shown by the records of the companies effecting the consolidation.

In Wood Exhibit 18 (R., page 8190-D) is found a statement of the reserves for depreciation and amortization taken over by The Ohio Bell Telephone Company at the time the various properties were acquired. From this study it will be noted that on September 21, 1921, the date of the formation of the present company, the total reserves amounted to $6,219,829.18 and the depreciable properties acquired amounted to $69,070,159.72. These figures would tend to show an initial reserve of 9.01% or a "per cent condition" of 90.99%, an absurdity as established by company witnesses hereinafter referred to. Between September 21, 1921 and June 30, 1925 the following properties were taken over at net cost with no depreciation reserves (Wood Exhibit 18, R., p. 8190-D):

Sandusky Home Telephone Company	$124,920.74
Springfield-Xenia Telephone Company	565,183.51
Franklin County Telephone Company	316,687.77
Montgomery County Telephone Company	85,761.98

Tuscarawas County Telephone Company	127,180.87
Upper Sandusky County Telephone Company	43,257.17
American Telephone & Telegraph Company	262,794.00

Obviously, the effect of such an accounting policy was to record these properties at 100% new, and to distort the per cent condition of the plant investment.

To accomplish the purposes of the consolidation vast sums were required and large quantities of old, obsolete and duplicating property had to be scrapped or abandoned. That the company experienced these abnormal replacements is clearly shown in a subsequent analysis made of data incorporated in the record.

COMMISSION OBLIGATED TO ANALYZE DEPRECIATION AND REPLACEMENT ENTRIES SINCE FORMATION OF COMPANY.

The cardinal principle upon which the commission based its study of depreciation was that the original capital in a public utility enterprise is to be furnished by its investors and, after this initial investment, the utility is permitted to charge annually as an operating expense an amount which measures the decline in value *during the year* attributable to wear and tear, obsolescence and inadequacy. (*Lindheimer v. Illinois Bell Telephone Company*, 292 U. S., 151, 78 L. Ed., 1182.) In principle, the distinction between the obligation of the investor and the charge against the patron of the utility is a clear one. In practice, it is frequently difficult in its application.

In this case, the commission, on account of the nature of the organization of the company, was required to make an exhaustive study of its history since 1921 to ascertain whether excessive depreciation had been charged against operating expenses in order to absorb the abnormal retirements during its program of unifying and rebuilding. It could not discharge its duty by merely accepting, without question, the company's costs of property retired. In its brief (page 39-41) appellant criticizes the commission for not allowing a depreciation rate which would have enabled the company to recover all of its retirements between 1925 and 1933. This argument would seem to be predicated upon the assumption that a rate-fixing body is merely to check upon the arithmetical accuracy of a utility's figures. Under this theory, the commission should have no interest in the extent to which the company was overcapitalized at the outset. Neither would it have a right to inquire as to the amount of depreciation which actually took place in previous years which was not assessed against the operations of those years. Such a concept of the functions of a rate-fixing body has been clearly disapproved by this court. (*St. Joseph Stockyards Company v. United States*, 298 U. S., 38, 65; 80 L. Ed., 1033, 1048.)

The purpose of the periodic charge for depreciation is to provide for the inescapable retirement of physical property. The only real test of a depreciation rate can be made by reviewing replacement experiences over a period of years to determine whether the amounts set aside annually have been reasonable for this purpose.

Appellant states (Appellant's Brief, p. 41) that the commission adopted the so-called "retirement method" in arriving at a depreciation rate. The inference apparently is that the commission was confused in its concept of the depreciation allowance and that it proceeded on the theory that the cost of property retired less salvage during a particular period should be allowed as a depreciation charge—exactly this amount and no more or less. In the commission's opinion (R., pp. 199, 200), it left no doubt as to its understanding of the relation between retirements and the annual charge:

> "The balance in the reserve on the date certain represents past accumulations for depreciation after deducting the actual retirements from year to year. These accumulations had been made by annual charges to operating expenses, i.e., by annual segregations of the revenues paid by subscribers for service received. Each year's reservation represents the company's estimate of the depreciation of its property in that year in serving subscribers, and the net accumulations in the reserve show what payments by subscribers set aside for this purpose are not yet needed, in the company's judgment, for physical retirement of property. In other words, the balance in the reserve shows the accumulated amount set aside to replace depreciated property in the future which customers have paid for in advance of writing the property out of the property and plant accounts".

What the commission did was to study retirements of the past in order to gauge the requirements of the future. The rates fixed were arrived at in accordance with the above principle as a basis.

ACCOUNTING REGULATIONS REQUIRE DEPRECIATION EXPENSE TO BE DISTRIBUTED EVENLY OVER LIFE OF PROPERTY.

The court's attention is invited to the instructions of the Interstate Commerce Commission with reference to depreciation of plant equipment. These instructions have been adopted by the Ohio commission. (Ohio Bell Telephone Company Accounting Circular No. 8, R., p. 7022.) Section (4) provides that "the rate of depreciation should be fixed so as to distribute *evenly* through the life of depreciating property the burden of extraordinary repairs and the cost of capital consumed in operations during a given month or year, and should be based upon the average life of the units comprised in the respective classes of property". In Section (6) it is stated that "Account 413—realized depreciation not covered by reserves is provided in the *corporate surplus or deficit Account* for charges for realized depreciation on tangible fixed capital retired, when such depreciation accrued prior to the establishment of Account 102—reserve for accrued depreciation Cr., *or has not been provided for by credits to that account*". (Italics ours.)

These regulations, not challenged by appellant as conflicting with sound accounting principles, require that the net cost of capital consumed in operations be prorated over the entire life and only those replacement costs can be charged against the depreciation reserve which have been previously credited to the reserve through the periodic charges to depreciation expense. All replacement costs not contemplated by such credits to the reserve are, by these regulations, to be charged against surplus which measures the profits of prior years reinvested in the enterprise.

COMMISSION FOUND RESERVE FOR DEPRECIATION AT SEPTEMBER 21, 1921, TO BE INADEQUATE AND ABNORMAL REPLACEMENTS OF $14,849,007 MADE POSSIBLE BY EXCESSIVE CREDITS TO DEPRECIATION RESERVE.

The commission, in attempting to establish a fair and reasonable depreciation rate, obviously, was forced to analyze the entries which had been made by the company in its depreciation reserve from the time of its organization in 1921 down to 1933. It had to ascertain the extent to which replacement losses had been financed from the depreciation reserves existing at the time of its organization and from those additions to the reserve made during the twelve and one-fourth years of its operation. In Table I the summary of the commission's findings with

respect to the adequacy of the depreciation reserve at the date of the company's organization, September 21, 1921, is found. Looking first at the period from September 21, 1921 to December 31, 1921, the cost of the plant retired (Column C) was $454,052, from which the company recovered $235,599 as salvage (Column D), showing a net realized depreciation of $218,453 (Column E).

TABLE I
THE OHIO BELL TELEPHONE COMPANY
REALIZED DEPRECIATION NOT COVERED BY RESERVES

Period	Depreciation Accrued Since 9-21-21 Period to Date A	B	Amount of Realized Depreciation: Original Cost of Plant Retired C	Salvage Value Recovered D	Net Realized Depreciation E	Covered by New Reserve Since 9-21-21 F	Distribution of Realized Depreciation: Covered by Old Reserve Prior to 9-21-21 G	Not Covered by Reserves H
9-21 to 12-31-21	1.05%	1.05%	454,052	235,599	218,453	4,768	213,685	.....
Year 1922	5.68%	6.73%	2,650,786	868,414	1,782,372	178,398	1,603,974	.....
Year 1923	5.75%	12.48%	6,171,608	2,928,472	3,243,136	770,217	2,472,919	.....
Year 1924	5.77%	18.25%	4,714,949	1,479,182	3,235,767	860,478	1,929,251	446,038
Total 3¼ Years			13,991,395	5,511,667	8,479,728	1,813,861	6,219,829	446,038
Year 1925	5.76%	24.01%	5,140,470	1,294,740	3,845,730	1,168,627	.....	2,677,103
Year 1926	5.80%	29.81%	7,547,432	1,514,589	6,032,843	2,249,889	.....	3,782,954
Year 1927	5.60%	35.41%	8,910,112	3,623,582	5,286,530	3,155,071	.....	2,131,459
Year 1928	5.58%	40.99%	8,597,660	2,862,790	5,734,870	3,524,181	.....	2,210,689
Year 1929	5.92%	46.91%	8,231,350	3,011,078	5,220,272	3,861,326	.....	1,358,946
Year 1930	5.91%	52.82%	10,342,918	3,419,613	6,923,305	5,463,129	.....	1,460,176
Year 1931	5.78%	58.60%	11,377,070	3,928,465	7,448,605	6,666,963	.....	781,642
Year 1932	4.50%	63.10%	8,540,442	3,807,372	4,733,070	4,733,070*	.....	*
Year 1933	4.18%	67.28%	8,144,396	2,510,261	5,634,135	5,634,135*	.....	*
Total 9 Years			76,831,850	25,972,490	50,859,360	36,456,391	.....	14,402,969
Total 12¼ Years			90,823,245	31,484,157	59,339,088	38,270,252	6,219,829	14,849,007

The above table has been prepared to show in Column H the realized depreciation not covered by reserves as defined by the Interstate Commerce Commission and this commission, and the computations are as prescribed under Account No. 413 in the Uniform System of Accounts for Telephone Companies, first issue, which provides as follows:

"Charge to this account the realized depreciation (i. e. the difference between the original cost and the salvage, if any) on tangible fixed capital retired, if such depreciation has not been provided for through a depreciation reserve. This includes such portion of the realized depreciation on any physical property which was installed prior to the period for which the reserve was established as is due to life in service before that period. This portion may be estimated on the basis of the proportion which the life in service of the property in question prior to the period for which the reserve was established bears to entire life in service."

The figures from 9-21-21 to 12-31-31 were secured from the following sources:

Column A is a composite of the depreciation expense percentages shown in the next to the last column of Wood Exhibits 12, 13-1, 13-2 and 13-3—R. 8182-B and 8183.

Column B shows the cumulative total of the percentages in Column A.

Columns C and D are taken from Wood Exhibit 11, lines 21, 22 and 29—R. 8182-A.

Column E equals Column C less Column D.

Column F equals the Column B percentage of Column C.

The total of Column F, G and H equals Column E.

The figures for 1932 and 1933 in Column A, C and D were taken from annual reports filed by the company with the commission

* As the Column B percent of Column C exceeds the amount of Column E in 1932 by $655,949, there was no realized depreciation not covered by reserves in that year and, therefore, only the amount of Column E is shown in Column F. While a difference of $154,585 would again appear as being not covered by reserves in 1933, it is not shown above for the reason that a sufficient period of time has elapsed to substantially absorb such realized depreciation as has not been covered either by the old reserve prior to 9-21-21 or the new reserve since 9-21-21.

The composite depreciation rate for the year 1921 was 4.14% or approximately 1.05% for the period under review. There was, therefore, credited to the reserve for depreciation on the assets retired during the period from September 21, 1921, to December 31, 1921, 1.05% on $454,052 which would amount to $4,768. The difference between the net realized depreciation, $218,453, and the amount credited to the reserve, $4,768 was $213,685 which, obviously, had to be charged against the reserve for depreciation which the company set up at the time the Ohio State Telephone Company and the original Bell company were consolidated. It will be recalled at this point that the total reserve for depreciation at the time of organization amounted to $6,219,829.

Going to the year 1922 we find that the plant costing originally $2,650,786 was retired (Column C) on which the company recovered as salvage $868,414 (Column D) leaving a net realized depreciation of $1,782,372. Again using the company's composite rate of 5.68% to which should be added the 1.05% which was applied on these assets during the previous year, we find that the cumulative composite rate was 6.73%. Applying this rate on the original cost of plant retired (Column C) it is obvious that depreciation amounting to $178,398 had been credited to the reserve on the assets retired since the date of the company's formation, leaving $1,603,974 which had to be charged against the reserve of $6,219,829 with which the company began business in 1921.

Going next to the year 1924 we find that the original reserve of the company became entirely exhausted and

during this year it was necessary to charge against the reserve for depreciation $446,038 in excess of the credits that had been previously made to the reserve on the assets retired. Carrying these calculations through the years we find that the total charges against the reserve for depreciation were $59,339,088, of which $38,270,252 were covered by the additions to the reserve since September 21, 1921, $6,219,829 were covered by the reserve in existence at September 21, 1921, and $14,849,007 represents the amount of realized depreciation in excess of the credits which had been made to the depreciation reserve on the assets retired. In other words, either the reserve for depreciation at September 21, 1921 should have been $14,849,007 greater or the company should have charged $14,849,007 of these replacements to "surplus" instead of "depreciation reserve", in accordance with the Interstate Commerce Commission regulations.

COMMISSION DETERMINED PERCENT CONDITION AT SEPTEMBER 21, 1921, TO BE 82.78% SHOWING A RESERVE FOR DEPRECIATION OF $14,638,870 INSTEAD OF $6,219,829.

One of the findings of the commission in this case, sustained by the Supreme Court of Ohio, which the company is not appealing to this court, was that the "per cent condition" of the fixed capital at June 30, 1925, the date certain, was 86.46%. It must be regarded, therefore, that this question in the original case has been completely and finally adjudicated. With a per cent condition of

86.46% at June 30, 1925 as fixed by the commission, it can be determined that the per cent condition at September 21, 1921 was 82.78% as shown by the following analysis: (Wood Exhibit 2, R., 8172.)

	Reproduction Value A	Present Value B	Percent Condition C
Fixed Capital found by Commission 6-30-25	108,112,644	93,473,774	86.46%
Less, Net Additions 7-1-21 to 12-31-25	3,171,454	3,171,454	
Computed Fixed Capital as of 12-31-24	104,941,190	90,302,320	86.05%
Less, Net Additions year 1924	6,671,423	6,671,423	
Computed Fixed Capital as of 12-31-23	98,269,767	83,630,897	85.10%
Less, Net Additions year 1923	2,805,318	2,805,318	
Computed Fixed Capital as of 12-31-22	95,464,449	80,825,579	84.67%
Less, Net Additions year 1922	4,701,154	4,701,154	
Computed Fixed Capital as of 12-31-21	90,763,295	76,124,425	83.87%
Less, Net Additions 9-21-21 to 12-31-21	5,754,503	5,754,503	
Computed Fixed Capital as of 9-21-21	85,008,792	70,369,922	82.78%

The per cent condition as at September 21, 1921 of 82.78% thus found is substantially supported by testimony of company witness Stephens (R., 1290) which was to the effect that property of similar character is normally in 83% condition.

By working backward from its final valuation at the date certain we can arrive at the reproduction value and the present value as at the date of the organization of the company. Thus we find the difference between the reproduction value and the present value at that date to be $14,638,870 which represents the amount which should have been carried in its "reserve for depreciation" instead of $6,219,829 as shown by its accounts.

To summarize, the depreciation rates used by the company were high enough during the ten year period from 1921 to 1931 to create an abnormally large depreciation reserve against which could be charged $14,849,007 of replacements, extraordinary repairs and removal costs pertaining to previous years but for which on the assets removed no such depreciation had been provided during the previous years. Stated in another way, excessive depreciation on assets still in service was charged and the excessive reserve so created was used to absorb the loss in scrapping old assets which the company should either have charged against surplus or should have anticipated at the time of consolidation by increasing its initial reserve for depreciation.

REPLACEMENT PROGRAM ABNORMAL AS SHOWN BY TESTIMONY OF COMPANY WITNESSES.

That the replacement program of the company following the consolidation was abnormal is admitted by the company through its chief witnesses, Mr. Williams, its valuation engineer, and Mr. Stephens, its vice president. Mr. Williams testifies (R., 1327) in part as follows:

> "I have also had consideration for the fact that during about the last four or five years there has been placed in the Ohio Bell Telephone Company's property, new property to the extent of almost fifty per cent of the now existing property."

Mr. Stephens testifies (R., 1274) as follows:

"Q. How does the general per cent condition of the total property of your company in Ohio today compare with its per cent condition at any time during 1923-1924 and 1925, if you know? A. It has been greatly improved during that period. In fact, it is getting better every day—every month.

Q. Why is that? A. Due to the fact that we are constructing new property at a considerably greater rate than, in my judgment, the deterioration takes place in the existing property.

Q. How do you know that, or on what do you base your judgment in that respect? A. Well, as testified to this morning, the gross additions to the property from 1923 to 1925 inclusive, not including purchases of going property, amounted to approximately $37,700,000.00 which is at the rate of approximately 12% per year, and I am positive that the deterioration is not growing at that rapid percentage. Furthermore, during the course of my inspection it was very easy to determine as I went along that the condition of the property was getting better.

Q. Have you any further reason for believing that the per cent condition today is higher than in any of the previous years? A. Yes, sir, as testified before, we took out of the plant, including the sales of property, approximately $19,000,000.00 and as a general thing that represented the older parts and portions of the property.

Q. Approximately how much of the present property of the company had been installed within the last four and a half years, if you know? A. I have that for four and a quarter years, that is since the formation of the existing company.

Q. That will do. A. About 45 per cent of the total property."

Mr. Stephens' testimony on pages 1255-1257 is also pertinent on this point:

> "• • • previous to the latter part of 1921 there had been two companies in the field. At that time, I understand—or at least I did understand at the time I came here, and now I know, that those properties were taken together and formed into a new company and the dual service existed at the time I came here and it was going to be necessary to give a unified service. I believe that was the purpose of the consolidation.
>
> • • • Now in connection with this unification and consolidation work and with this construction work to provide telephone service for new subscribers, I would estimate that we have covered at least 75 per cent and possibly 80 per cent of the entire property in this state.
>
> Q. Do you mean by that that 75 to 80 per cent of the property of the company has been reconstructed in this state under your supervision? A. That is it exactly, that is, it has been considered for reconstruction. We did not build 75 per cent of the property new, but in consideration with what we did and the particular areas where we placed this property, we had to rearrange and work over at least 75 per cent of the property in the state".

Appellant in its brief (p. 44) states that the retirement losses during the period under investigation were not abnormal. On page 45, however, is a statement that between 1925 and 1930 an additional investment of $65,000,000.00 in plant was required and "To meet this unprecedented growth, large quantities of all classes of plant had to be retired because of inadequacy". This last statement can only be interpreted to mean that the volume of retirements was certainly abnormal.

Admitting that the program of unification was in the public interest and with the commission's knowledge and approval, it must also be stated, at this point, that the company did not represent to the commission that higher depreciation rates would be necessary to effectuate it. The company fixed its depreciation rates with full knowledge that their reasonableness would be determined in the state wide rate study. The commission has now found that a 4% rate would have been entirely adequate.

COMPANY VOLUNTARILY REDUCED RATE TO 4.18% IN 1933.

It is a singular fact that as shown by Table I the deficiency in the depreciation reserve having been absorbed by the year 1931, the company in 1932 voluntarily reduced its composite depreciation rate from 5.78% in 1931 to 4.50% in 1932, followed by 4.18% in 1933. Certainly this voluntary act on the part of the company can only be construed as indicating that the company had completed its program of replacing the obsolete and duplicating equipment acquired in 1921 and the need for the large depreciation reserves with which to finance this program no longer existed. The contention of the company that the depreciation rates in effect since 1925 were fair and reasonable and should be continued should have no weight in this court even if all of the data contained in the above discussion are disregarded. The depreciation rates used by the company during these years were as follows:

1925, 5.76%; 1926, 5.80%; 1927, 5.60%; 1928, 5.58%;

1929, 5.92%; 1930, 5.91%; 1931, 5.78%; 1932, 4.50%; 1933, 4.18%. Thus it will be seen that the average depreciation rate used by the company between 1925 and 1931 inclusive was 5.76%. The company in 1933 in adopting voluntarily a composite rate of 4.18% gave recognition to the fact that its depreciation needs will be 27.43% less beginning with 1933 than they were between 1925 and 1931. The statement in appellant's brief (p. 48), in so far as inadequacy is concerned, is partial admission of this fact. Can the company, in view of its own act, deny that their replacement experiences between 1925 and 1931 were abnormal? Could the company, in good faith, expect the commission to accept these high rates as normal and as being necessary in order to maintain its physical plant?

Appellant in its brief (p. 37) attempts to convince the court that the commission studied only the retirement experiences of the company between 1921 and 1925 and neglected to examine the experiences between 1925 and 1933.

The inaccuracy of the above statement is apparent. The commission had all of the preceding data before it dealing with replacements and retirements from 1921 to 1933, and arrived at its judgments after a careful inquiry concerning the amount and nature of these retirements.

PROPERTIES ACQUIRED SINCE 1921 WITH INADEQUATE DEPRECIATION RESERVES.

With respect to the inadequacy or entire lack of depreciation reserves in connection with purchased properties, the commission found exactly the same circumstances applicable to a lesser degree and considered that the depreciation which had taken place in such properties up to the time of their acquisition should have been provided for out of the earnings of those properties previous to the date of acquisition. Whatever the circumstances may have been which resulted either in the failure of the selling companies to provide for or record adequate depreciation or the failure of purchasing company to recognize and record the amount thereof on its books, these circumstances should not be permitted to shift the burden of making good such neglected depreciation out of current earnings of the purchasing company. It is apparent that such a shifting of burden has taken place in this case and that due to these unwarranted demands on the earnings of The Ohio Bell Telephone Company, its charges for depreciation expense requirements have been unduly excessive. The measure of this excess is obtained from an analysis of the properties and reserves acquired by purchase as shown on Wood Exhibit 18 (R., p. 8190-D) which has been summarized and interpreted as follows. This summary shows that the company acquired depreciation reserves of $7,539,736 which the commission interprets should have amounted to $17,459,656, leaving a deficiency in reserves acquired of $9,919,920.

Wood Exhibit 18	As Recorded on Books			As Interpreted by Commission		
	Book Cost	Depreciation Reserve	% Cond.	Book Cost	Depreciation Reserve	% Cond.
Old Ohio Bell & Ohio State Tel. Cos. (line 3)....	69,070,160	6,219,829	90.99	85,008,792	14,638,870	82.78
Properties purchased with Reserves (lines 4, 5, 8, 10, 20, 21, 26, 27, 34 & 39).	6,514,206	1,319,907	79.74	6,514,206	1,319,907	79.74
Properties purchased without Reserves—A. T. & T. Co. (line 22)	1,579,593	—	—	1,928,549	943,729	51.07
Other properties prior to 1-1-25 (lines 6, 7, 9, 11, 14)	1,481,987	—	—	1,481,987	300,251	79.74
Other properties since 1-1-25 (lines 15, 17-19, 23-25, 28-33 and 35-38)	1,268,010	—	—	1,268,010	256,899	79.74
	79,913,956	7,539,736	90.57	96,201,544	17,459,656	81.85

The deficiency in the reserves acquired from The Ohio Bell and Ohio State Telephone Companies amounts to $8,419,041, and was computed in connection with checking the "per cent condition" of the property, as has been heretofore discussed.

The deficiency in the reserves acquired from the American Company amounting to $943,729, pertains to the telephone instruments purchased from that company as of December 31,1927. The total instruments disposed of by the American Company were sold to various Bell operating companies for a consideration of $38,183,727 (Exhibit X121, R., p. 9061), and of this amount The Ohio Bell Telephone Company purchased $1,579,593 or 4.14%. (Wood Exhibit 18, line 22, R., p. 8190-D.) This total amount of instruments stood on the books of the American Company at a cost of $46,583,314, less a depreciation reserve of $22,795,386, or at a net book value of $23,787,928. (Exhibit X121.) Applying the 4.14% to these figures produces the proportion thereof applicable to The Ohio Bell Telephone Company in the amounts of $1,928,549, gross book cost, $943,729 depreciation reserves and $984,820 net book cost. When the close inter-company relationship between the seller and purchaser in this case is considered and the fact that the American Company realized a profit on the transaction of $14,395,799 (Exhibit X121), of which 4.14% or $595,986 was allocable to sales to The Ohio Bell Telephone Company, there appears to be no justification whatever of recording the transaction on the books of the latter company in such a way as to deprive it of the accrued depreciation reserve

of $943,729, as of the date of purchase. This procedure places an undue burden upon the operations of The Ohio Bell Telephone Company and its subscribers, to again build up a reserve on a large amount of telephone instruments which were about to become obsolete due to change in public demand for a more modern type, especially when the portion of such reserve which had already been created was withheld and retained by the parent company in its surplus account for the benefit of its stockholders.

The deficiency in the reserves acquired from other companies on properties purchased prior to January 1, 1925, $300,251, and properties purchased since January 1, 1925, $256,899 has been estimated by the commission on the basis of applying to such properties the same "per cent condition", 79.74% as the record shows applied to the properties acquired from companies where depreciation reserves were recorded. It is understood that in recording the purchase of these properties without reserves the company entered only the net or depreciated value of the property on its books, and while this net value is not questioned, this method of recording resulted in showing these properties as being in 100% condition. It was, therefore, necessary for the commission to determine the approximate amounts that should have been taken into the depreciation reserve account, in order to give proper consideration to the depreciation requirements. This has been the purpose of estimating these unrecorded reserves and due weight thereto has been given in the determination of the allowance for depreciation expense.

With respect to the amount of depreciation expense required to maintain a proper depreciation reserve, the commission has not disturbed the amount set aside by the company prior to 1925 as it antedates the period covered by this inquiry. However, in considering the period covered by this inquiry the commission has made a reduction of $17,267,353 in the amount of depreciation on telephone plant and equipment, but as to the depreciation expense on general equipment amounting to $2,096,017, it has made no change in the amount shown by the company's books. The reduction above referred to is occasioned by the use of a 4% annual rate, instead of the annual rates used by the company, applied to the value of the depreciable fixed assets affected thereby in the manner shown in Appendix K of the commission's opinion. (R., 242.) The commission was satisfied that this was a fair and equitable rate, fully adequate to meet the normal depreciation requirements of the company. It appears significant that, having passed through the period during which the book reserve was adversely affected by the erroneous treatment of reserves on purchased properties and realized depreciation not covered by reserves, above commented upon, the company voluntarily reduced its annual depreciation rate to the more normal figure of 4.18% in 1933 and still carries forward an excessive depreciation reserve balance of $21,999,901, which causes its books to show the relatively low "per cent condition" of 86.81% at December 31, 1933.

FOUR PERCENT RATE, DUE TO HIGH SALVAGE RECOVERY, MEANS COMPOSITE LIFE OF 18.24 YEARS.

It might at first be assumed that the 4% depreciation rate which the commission prescribed contemplates a composite life for the entire plant of twenty-five years. This assumption would be erroneous. In the first place, the rates of depreciation in use by the company on special classes of equipment, namely, general stable and garage equipment, general store equipment, general tools and implements were not disturbed. The 4% rate applies to all other classes of depreciable telephone plant and equipment accounts. Again, as testified by company witness Stephens (R., p. 1290), the salvage recovery in the telephone industry is unusually heavy, being about 23%, thereby reducing the amount which must be charged against the reserve when replacements are made. Referring to Wood Exhibit No. 11 (R., p. 8182-A), it is found that for the period from September 21, 1921, to December 31, 1931, the cost of plant removed or abandoned was $71,584,815 and the cost of plant sold was $2,553,592. In scrapping these assets, a total of $25,166,524 was recovered as salvage which is partially offset by the cost of removal and extraordinary repairs aggregating $5,121,578. The net recovery from assets costing $74,138,407 was, therefore, $20,044,946. The net depreciation to provide for at a 4% rate was, therefore, $54,093,461. By the application of a 4% rate to the base

figure ($74,138,407), the net sum ($54,093,461) could be accumulated in 18.24 years. This would mean that the company could replace 5.48% of its physical plant each year with the depreciation reserve that would be accumulated under the 4% rate prescribed by the commission.

FOUR PERCENT RATE GIVES PERCENT CONDITION AT DECEMBER 31, 1933, OF 91.21%.

The net result of the commission's findings is clearly shown in the following summary:

Depreciation Reserve:*	Shown by Books of Co. A	Reconstructed from Record B	Increase of Decrease (*) C
1. Balance Depreciation Reserve 9-21-21	6,219,829	14,638,670	8,419,041
Credits 9-21-21 to 12-31-24:			
2. Depreciation Expense—Plant and Equipment	14,214,948	14,214,948	.....
3. Depreciation Expense—General Equipment	499,750	499,750	.....
4. Transfers and Adjustments	9,915	9,915	.....
5. Recorded Reserves on Purchased Properties	610,231	610,231	.....
6. Unrecorded Reserves on Purchased Properties	.....	300,251	300,251
7. Total 9-21-21 Balance Plus Credits	21,554,673	30,273,965	8,719,292
8. Less, Net Charges 9-21-21 to 12-31-24	9,728,614	9,728,614	.....
9. Balance Depreciation Reserve 12-31-24	11,826,059	20,545,351	8,719,292
10. Depreciation Expense—Plant and Equipment	62,533,967	45,266,614	*17,267,353

Depreciation Reserve:*	Shown by Books of Co. A	Reconstructed from Record B	Increase of Decrease (*) C
11. Depreciation Expense—General Equipment	2,096,017	2,096,017	.....
12. Transfers and Adjustments.	81,094	81,094	.....
13. Reclassifications	272,424	272,424	.....
14. Recorded Reserves on Purchased Properties	708,582	708,582	.....
15. Unrecorded Reserves on Purchased Properties	.....	1,200,628	1,200,628
16. Total 12-31-24 Balance Plus Credits	77,518,143	70,170,710	*7,347,433
17. Less, Net Charges 1-1-25 to 12-31-33	55,518,242	55,518,242	.....
18. Balance Depreciation Reserve 12-31-33	21,999,901	14,652,468	*7,347,433

From this statement the court will note that if the company had started business in 1921 with a depreciation reserve of $14,638,870 instead of $6,219,829 and if properties purchased subsequent to that date had been recorded on the books of the company with reasonable reserves for depreciation, the balance in the reserve for depreciation account would have been increased $9,919,920 (Lines 1, 6, and 15 of above statement).

In company brief (page 47 supported by table on page 15) criticism of the 4% rate prescribed by the commission is made to the effect that if the rate had been applied from 1925 to 1933 the balance in the reserve would have been only $3,908,911. In making this calculation, the above deficiency of $9,919,920 in the reserves on purchased properties has been completely ignored. If this amount is added to the $3,908,911 computed by the company, a corrected balance of $13,828,831 would be obtained. This would show a percent of the reserve to the

average cost of depreciable property for 1933 (Column 6 to Column 3) of 9.32% instead of 2.64% as shown in Column 7. In terms of percent condition, this would amount to 90.68% which appears to be entirely reasonable.

As a result of using the 4% annual depreciation rate on all classes of depreciable telephone plant and equipment except such general equipment items for which the book depreciation rates were approved, and of considering only the inadequacy of reserves acquired by purchase, but not the item of realized depreciation not covered by reserves, a corrected depreciation reserve balance of $14,652,468, at December 31, 1933, is arrived at. A further proof of the adequacy of this reserve in comparison with the value and percent condition of the property can be made as follows:

	Gross Fixed Capital	Depreciation Reserve	Per Cent Condition
Comparisons as of 12-31-33			
1. Compared with books:			
Book Value and Book Reserve	166,757,394	21,999,901	86.81%
Book Value and Corrected Reserve	166,757,394	14,652,468	91.21%

It has been previously pointed out that the 86.81% condition shown by the books is unreasonably low considering the extent to which additions of new plant replacing old plant have been made. Substitution of the corrected reserve results in showing the much more logical 91.21% condition at 12-31-33.

CRITICISM OF INCONSISTENCY MADE BY COMPANY ENTIRELY WITHOUT FOUNDATION.

On page 38 of the company's brief criticism is made to the effect that the commission was inconsistent to the extent that it determined the ratio of actual retirement losses to undepreciated costs for the period from September 21, 1921, to June 30, 1925, and having found this ratio to be 3.74%, fixed a rate of 4% to be applied on the present value as at that date (Reproduction New Less Depreciation) and also to be applied in each of the succeeding years to the present value at the date certain plus net additions at actual cost. The facts which apparently the company had in mind are the following:

	Commission's Valuation		*Company's Books*	
	Reproduction	*Present*	*Undepreciated*	*Depreciated*
Total Fixed Capital...	108,112,644	93,473,774	98,712,030	86,151,527
Less, Non-depreciable Property*	10,378,814	9,142,880	8,882,771	unknown
Depreciable Property	97,733,830	84,330,894	89,829,259	unknown
4% depreciation allowed		3,373,236		
% of other values of Depreciable Property	3.43%	4.00%	3.78%	3.915%

* While some of this property is depreciable, the rate of depreciation and the amounts allowed by the Commission are not disputed. It is termed "Non-depreciable Property" only to differentiate from "Depreciable Property" subject to dispute.

The company complains that the commission's allowance of 4% on present value at June 30, 1925, amounts to

only 3.45% on reproduction cost new value at that time. It does not advance any arguments in support of the principle that it should recover through subsequent depreciation allowances any amount in excess of the value found by the commission as being used and useful for service of the public as of June 30, 1925. This amount shows the present value of $84,330,874.

This charge of inconsistency is entirely without foundation. Throughout this case it was certainly understood by both the company and the commission that due to the impossibility of obtaining the original costs of the properties acquired by The Ohio Bell Telephone Company in 1921 with any reasonable degree of accuracy (Hagenah Exhibit, R., 6549-6550) appraisal of the property as at June 30, 1925, was to be used as a base figure for the purpose of fixing the rate of return and the depreciation rate throughout subsequent years. Due to the practice of the company heretofore referred to in this brief (page 96) of taking over properties from the predecessor companies without depreciation reserve and merely recording them on the new books at net present value figures, no alternative was present. In the final analysis, the depreciation rate should provide for the recovery of capital funds invested during the expected life of such property. It is apparent, as shown by the commission's analyses, that a 4% rate applied on the present value at June 30, 1925, and continued during the subsequent years on this value and also upon the actual costs of net additions will enable the company to fully recover these values in accordance with the accounting regulations pre-

scribed by the Interstate Commerce Commission and by The Public Utilities Commission of Ohio (see page 83).

What the commission attempted to do was to determine a rate which, when applied to present value as at June 30, 1925, would be equivalent to the 3.74% rate applied to original cost which was determined by an examination of the replacement experiences to be adequate. The court will observe in the above table that the company's books showed the original cost of the property to be $89,829,259 and the present value assigned to such property by the commission was $84,330,894. In other words, the company's original cost *undepreciated* was 106.5% of the commission's present value (cost of reproduction less depreciation). 106.5% of 3.74% gave the commission 3.98% to be applied on present value. This percentage was rounded out to 4%. The company's contention falls completely for the reason that a 4% rate applied on present value will actually premit the company to charge slightly more than its retirement experiences between 1921 and 1925 had required. The 4% rate on present value was intended to be the 3.74% rate on actual cost and their criticism of inconsistency is without merit.

All of the preceding tests and analyses establish the reasonableness of the 4% depreciation rate prescribed by the commission in making provision for the retirement and abandonment of units of property when they, through physical wear and tear, obsolescence and inadequacy must be replaced by new and modern units.

NET EFFECT OF APPLICATION OF COMMISSION'S 4% DEPRECIATION RATE.

The commission followed the principle that the depreciation charge for rate making purposes should be high enough to maintain the telephone plant in a state of high efficiency but that improvement in the form of substitution of one hundred per cent new property for old and obsolete property should not be made at the expense of the patrons of the company. It ascertained that $14,849,007 of such improvements had been so charged and it was liberal in permitting $6,429,966 of these charges against the depreciation reserve to stand.

The commission permitted all excessive depreciation from September 21, 1921, to June 30, 1925, to remain.

The commission limited the depreciation charges since June 30, 1925, to the amount which would be normally required to maintain the property. It took the position that the present patrons should not be assessed for depreciation which took place years ago for which the company did not make adequate provision. On this point the position of the commission is unassailable. Any suggestion to this court that such costs of improvements in physical property are to be recognized as operating expenses is absurd.

The fact is that the rates of depreciation prescribed by the commission were entirely adequate to produce a sum sufficient to replace appellant's property on the ex-

piration of its life and the finding of the commission to that effect is fully supported by the record.

In a recent decision of the court *(Clark's Ferry Bridge Company v. Public Service Commission of Pennsylvania,* 291 U. S., 225, 240; 78 L. Ed., 767, 774) it was held that:

> "The question of the amount which should be allowed annually for depreciation is a question of fact. • • • In reviewing the findings of the state court we are not required to enter a debatable field of fact and to choose and prescribe an invariable method of computation. To justify the overruling of the determination of the state court we must be able to see that what has been done will produce the result which the Constitution forbids. • • •"

Cf. *Michigan Public Utilities Commission v. Michigan State Telephone Co.*, 228 Mich., 658, 200 N. W., 749;

Lindheimer v. Illinois Bell Telephone Co., 292 U. S., 151, 78 L. Ed., 1182;

St. Joseph Stock Yards Co. v. United States, 298 U. S., 38, 78 L. Ed., 1033.

The Supreme Court of Ohio concluded an extended discussion of this subject with the following statement (R., 581-2):

> "We have made a conscientious examination of the voluminous evidence relating to 'depreciation' and have analyzed it to the best of our ability with regard to the conflicting contentions of the adverse parties. There being substantial support for the findings and order of the commission on this feature of the case, they wil be permitted to stand."

LICENSE CONTRACT PAYMENTS.

An administrative body such as The Public Utilities Commission of Ohio, in passing upon the reasonableness of the operating expenses of a public utility operating under its jurisdiction, is not bound to accept as conclusive the amounts allegedly paid by such public utility to its parent company for services presumably rendered by the parent company to the operating company under a license contract made between these affiliated concerns but such an administrative body may inquire into the value and the propriety of such services, and upon the basis of the evidence introduced and in the exercise of its administrative discretion, it may determine the fair and reasonable value of the services and the propriety thereof, and this determination made upon proper evidence should not be disturbed by any reviewing court.

As a part of its annual operating expenses the company claimed substantial amounts to cover what is known as license contract payments made by it to its parent corporation, American Telephone and Telegraph Company, for services allegedly furnished by the American Telephone and Telegraph Company to The Ohio Bell Telephone Company. The commission, after careful consideration, was of the opinion that a portion of the payments claimed was for the purpose of defraying costs incurred by the parent company with no resultant benefit to the operating company. These payments were therefore disallowed and they represent substantially all of the reductions made by the commission in the license contract payments claimed by the company. These re-

ductions as made by the commission are reflected in the following table:

Year	License Contract Payments Claimed By Company	Amount Allowed by Commission
1925	$1,237,644	$505,215
1926	1,239,094	557,090
1927	1,356,855	615,849
1928	727,157	406,709
1929	602,828	427,055
1930	615,775	514,869
1931	595,581	501,231
1932	529,796	506,494
1933	453,849	453,849

(Commission Finding, Appendices F, G, H, I and J, R., 236-41.)

For a complete discussion of this topic see commission's opinion (R., 206-19).

In studying the foregoing table, it is interesting to observe that the heaviest reductions made by the commission in the license contract payments occurred in the years 1925 to 1928 inclusive, and that the differences between the amounts claimed by the company and the amounts allowed by the commission for the years 1929 to 1933 grew progressively less until in the year 1933 the amount allowed by the commission equaled the amount claimed by the company.

When it is recognized that prior to 1926 the payment under the license contract was 4½% of the gross revenues, and that beginning January 1, 1926, it was 4% of the gross revenues, and beginning January 1, 1928, it was 2% of gross revenues, and beginning January 1,

1929, it was 1½% of gross revenues (R. 6804A; 6815-17), the court will understand the basis for the greater reductions made by the commission in the earlier years, for if the parent company could, beginning January 1, 1929, perform services for the benefit of its subsidiaries at a cost of 1½% of its gross revenues where it formerly performed these services at a cost of 4½% of its gross revenues, there must have been some period where the services were rendered at excessive costs.

The position of the company apparently is that since evidence was introduced to the effect that certain payments had been made by it to its parent company, American Telephone and Telegraph Company, for services rendered by the parent company to it, that the commission was bound to accept these payments in the full amount claimed and allow them as a part of the company's operating expenses for the purpose of determining the fairness of its rates. In other words, that the payments so made by the subsidiary company to the parent company for services allegedly rendered to the subsidiary company by the parent company must be accepted by the commission as conclusive as to the value and propriety of these services. Such a contention is not supported by law.

Western Distributing Company v. Public Service Commission of the State of Kansas, 285 U. S., 119, 75 L. Ed., 655;

Smith v. Illinois Bell Telephone Company, 282 U. S., 133, 75 L. Ed., 255;

Dayton Power and Light Company v. Public Utilities Commission of Ohio, 292 U. S., 290, 78 L. Ed., 1267;

Columbus Gas & Fuel Company v. Public Utilities Commission of Ohio, 292 U. S., 398, 78 L. Ed., 1327.

The question here presented therefore is not whether or not the amounts paid by The Ohio Bell Telephone Company to American Telephone and Telegraph Company were actually paid, but rather whether or not the amounts paid represent the true value of the services rendered and is concerned with the propriety of the charges assessed by the parent corporation against its subsidiary *(Smith v. Illinois Bell Telephone Company,* supra). Certainly The Public Utilities Commission of Ohio is not bound to accept the amount which the company contends that it has paid to its parent corporation under a license contract made between affiliated companies as conclusive evidence of the propriety and value of the charges covered by the contract.

On the contrary, under the decisions of this court, The Public Utilities Commission of Ohio may determine the reasonableness and the propriety of the amounts to be included in operating expenses of an operating company in such a case and its findings in that connection should not be disturbed by a reviewing court unless its decision is manifestly against the weight of the evidence and constitutes an abuse of the administrative discretion vested in the commission.

In the case of *Smith v. Illinois Bell Telephone Company,* 282 U. S., 133, this court said:

> "In view of the findings, both of the state commissions and of the court, we see no reason to doubt that valuable services were rendered by the American company, but there should be specific findings by the statutory court with regard to the cost of these services to the American company and the reasonable amount which should be allocated in this respect to

> the operating expenses of the intrastate business of the Illinois Company in the years covered by the decree."

And that is precisely what the commission did. It did not challenge the fact that some services had been rendered by the American Company to The Ohio Bell Telephone Company, but it was unwilling to accept these charges in the face amount contended for by the company and accordingly made certain reductions therein, and, as we have heretofore indicated, the commission's findings in this connection should not be disturbed by this court unless the commission acted arbitrarily and unreasonably and contrary to law.

The company in its brief (Appellant's Brief p. 51 and 52) contends that it proved the cost to the American Company of furnishing the license contract services by first showing that the license contract services were needed and used by appellant and valuable to it in the operation of its telephone plant; secondly, by showing that the appellant's payments therefor during the period did not exceed the actual cost to the American Company of furnishing the services; by showing thirdly, that the allocation to appellant's intrastate business of its proportion of such cost was proper and finally, by showing that the services were worth more than appellant's payments therefor. The company will admit, however, that the "proof" to which they refer is predicated upon allocations made by various employees of the company and at the best is based upon estimate and opinion judgment, and that no records have been kept by the American

Company showing separately the cost of rendering license contract service (R., 3336; 3338; 3392; 3529; 3534). In the face of such "proof" largely conjectural in its nature, the commission certainly was left free to exercise its judgment as to what would be a proper allowance to the American Company under the license contract.

Field Occupied by the American Telephone and Telegraph Company.

The commission in its opinion (R., 207-10) points out that it is difficult, if not impossible, to determine with any degree of correctness the value and the cost of the services rendered by the American company to its Bell subsidiaries without a thorough comprehension of the wide field occupied by the American company.

Without repeating the entire discussion contained in the commission's opinion on this subject, we should like to recite briefly certain portions of the opinion in order that the court may understand the many ramifications of the American Telephone and Telegraph Company.

The American company owns directly or indirectly more than 90% of the combined voting stock of the twenty-four companies associated with it as the Bell system, together with the long distance lines which connect the wires of the different companies. The Bell system forms an inter-communicating system of nearly fourteen million telephones with which are connected the lines of nearly seven thousand other companies and more than twenty-six thousand rural lines covering the entire United States. Service is provided to Canada, Cuba and

Mexico by wires and by radio telephone to most of the countries of Europe, South America, South Africa and the islands of the sea, so that 92% of the entire telephones of the world can be reached by the Bell system.

In 1931 the telephone company introduced the use of the teletype writer, a valuable adjunct to the newspaper service.

The company owns 98% of the stock of the Western Electric Company, 50% of the Bell Telephone Laboratories by direct ownership and practically the remaining 50% through its ownership of the Western Electric; all of the stock of the Bell Telephone Securities Company, the Eastern Telephone and Telegraph Company of Canada and 50% of the stock of the Cuban company.

The Bell Telephone Company of Canada, of which stock the American company owns 24%, owns and operates toll lines and telephone exchanges in Quebec and Ontario. Through the Cuban company it owns certain valuable concessions and rights in Cuba and has submarine cables to that island.

The Western Electric Company manufactures and distributes telephones and other electrical apparatus mostly to the Bell system. It is also purchasing agent for that system. Its largest manufacturing plant is at Hawthorne, Illinois, with at least two other important plants. The company formerly conducted a foreign business which in 1925 it sold at a large profit. Its present territory now corresponds to that of the Bell system. Upon the sale in 1927 by the Western Electric of its foreign business a cash dividend of $48,000,000 was received by

the American company, which was added to the surplus of the company.

The American company and the Western Electric Company own jointly the Bell Telephone Laboratories, it being nearly all owned by the American company through its ownership of the stock of the Western Electric. This company took over all the research and development functions formerly performed by the Western Electric.

The inventions of the telephone laboratories have contributed to the progress of electrical science outside the strictly telephone field. To make these developments available in such other fields the Electrical Research Products, Inc., was organized in 1926, wholly owned by the Western Electric and through it by the American company. Non-telephone activities were thus given special attention without conflict with the telephone work. Such activities relate to submarine cables, phonographs, talking motion pictures and many other activities.

In 1930 the American company acquired the Teletype Corporation now operating as a subsidiary of Western Electric. The American company also owns the Bell Securities Company to facilitate transactions in Bell Telephone securities.

The American company has other contracts with telephone companies and is engaged in the development of the use of telephone wires for broadcasting and has developed short wave transmitting telephone stations for foreign service and for communication with airplanes and with ships at sea. The company through its research

activities has secured patents covering inventions of its research laboratories in the field of radio and has recently turned over to the Radio Corporation of America the right to manufacture and distribute radio equipment utilizing such inventions. It has also been active through its laboratories in the development of the art of television and telephoto and has engaged in many other activities reaching out and developing new sources of profit not connected with telephone business.

Limitations of space and time do not permit of a complete discussion of the varied and numerous activities of the American Telephone and Telegraph Company and in the foregoing statement we have attempted merely to set forth briefly some of the activities of this company in order that the court may understand a little more clearly the problems that are here presented in so far as license contract costs are concerned.

THE COMMISSION'S DISALLOWANCE OF PORTIONS OF LICENSE CONTRACT COSTS.

Before the Supreme Court of Ohio, the appellant attempted to substantiate its claim for additional allowances for payments made under its license contract with the American company, by the submission of ten different classes of costs disallowed by the commission either in whole or in part for services rendered in the following departments: Department of development and research; information department; personnel department; public relations department; treasurer's department; comptroller's department; secretary's department; adminis-

tration department and general service bureau; department of operations; depreciation of telephone instruments; contingent liability for patent infringement assumed by American company under the license contract.

In this court, the appellant has abandoned its contentions with respect to the information department; the public relations department; secretary's department; administration department and general service bureau: department of operations and depreciation of telephone instruments, leaving for this court's consideration only the department of development and research; contingent liability for patent infringement; treasurer's department; personnel department and comptroller's department.

We shall, therefore, consider briefly each of these divisions separately.

Department of Development and Research.

This department was organized in 1919 (R., 3538). The expenses charged under this heading included all of the expenses of the department, together with a portion of the engineering department of Western Electric. In 1925 Bell Telephone Laboratories, Inc., was incorporated by American Telephone and Telegraph Company and Western Electric and American Telephone and Telegraph Company's portion of the costs of Bell Telephone Laboratories is included from that date on (R., 3384-86; 3546). This department unquestionably performs some services of benefit to the associated companies. The difficulty with the company's allocations, however, is that it charges practically all of the expenses to the operating

companies without crediting any of the benefits to those companies.

Since the inception of this department in 1919 the company has not credited against the cost of operating it any of the moneys received by way of royalties nor has it shown any credits for the profits received from non-Bell sales of telephonic appliances made by International Western Electric and its subsidiaries Northern Electric Company, Ltd., International Standard Electric, Automatic Electric or Graybar, where American Telephone and Telegraph inventions were used without any royalties. In the footnote of Heiss Exhibit A-201-B (R., 8843), appear the total amounts which the company claims to have received from royalties and license fees during the period 1923-1931, aggregating $5,229,141 for the period (see also R., 8837). Nowhere is it shown in dollars exactly what the benefit to American Telephone and Telegraph has been by reason of the sale by the above named companies of products manufactured under American Telephone and Telegraph patents. The company by license contracts with General Electric, Radio Corporation of America, Westinghouse Electric, and others, as far back as 1920, was assured of the use of patent rights owned or acquired by these companies so far as their use in the telephonic field was concerned, while they in turn were given the benefit of American Telephone and Telegraph patents in radio. None of these benefits to American Telephone and Telegraph Company as the parent company were estimated or credited by it

against the cost of the development and research department.

The commission in passing upon this particular subject concludes its discussion as follows (commission opinion, January 16, 1934), (R., 211-12):

> "The state admits that this department does much to benefit the associated companies, but we are of the opinion that numerous expenses and costs claimed are not related to Ohio Bell Telephone operations and do not constitute a proper charge under the license contract. This appears self-evident from the nature of the service for which the expenditures are made. We are disposed to and do eliminate and disallow all costs and expenses incident to the following services and items: picture transmission, television, radio and submarine cable telephone connecting equipment and circuits, radio transmission systems, vacuum tubes, photo electric cells and submarine cables. These items and amounts charged for each appear in Exhibit A-118-B. The amounts disallowed for the year 1925 and subsequent years to 1931 inclusive are set forth in Appendix 'I' hereto attached.
>
> "The remainder of the costs claimed by the company in the department of development and research will be allowed as proper license contract expenses."

Contingent Liability for Patent Infringement Assumed by American Company Under the License Contract.

The company claims approximately $1,000,000 as a cost allocable to The Ohio Bell Telephone Company for the period involved in connection with this particular service of the parent company. The commission disallowed the contention of the company in the following

language: (Commission opinion, January 16, 1934, R., 218.)

> "The license agreement also provides that the licensee is entitled to receive from the licensor services in relation to patented and improved devices, and immunity from loss by reason of infringements.
>
> "The possibility of infringement damage is too remote to charge the rate payer for a cost or expense which does not exist and not likely to arise when we consider that during all the years from 1925 to the present time there has been no cost to the American company in the way of loss or damages because of patent infringements of apparatus used by the patrons of the Ohio Bell Company.
>
> "We consider that having allowed all of the legal expenses claimed for by the American company that whatever services may have been rendered in the way of defending infringement cases have been fully compensated in the allowance of legal services already mentioned. For said reasons no amount is allowed as operating expenses under said license contract for alleged patent infringement by way of losses, damages or otherwise, except as already noted in the way of legal expense."

In its brief (Appellants Brief, p. 58), appellant contends that two suits involving patent infringements had been instituted against the American company and licensee companies involving several hundred millions of dollars. That the amounts claimed were extravagant is admitted (R., 4644), and the fact is nothing was paid on such claims. Furthermore, appellant was not involved in such suits. It would seem that when appellant had paid to the American company large sums ranging from 4½% to 1½% of its gross revenues for the use of

patented devices it had paid all it should for the use thereof and should not be required to contribute additional large sums for indemnity against the use of a patent already amply paid for.

In its discussion of this topic the company in its brief (Appellants Brief, p. 58), quotes from the decision of the statutory court in the Illinois Bell case *(Illinois Bell Telephone Company v. Gilbert et al.*, 3 Fed. Supp., 595). Suffice to say that the decision of the statutory court in the above entitled case was reversed by this court in the case of *Lindheimer v. Illinois Bell Telephone Company*, 292 U. S., 151, 78 L. Ed., 1182, and by virtue of that decision the Illinois Bell Telephone Company was directed to repay to its subscribers in the Chicago area approximately $30,000,000 in refunds.

Treasurer's Department.

The functions of the treasurer's department were described by Mr. Heiss (R., 3350-1). The allocations for this department were made by Mr. Heiss (R., 6804-A), although he was not the responsible head, the treasurer of the company being Mr. Hugh Blair-Smith (R., 4227). Mr. Blair-Smith testified by deposition as to the costs of this department dividing them into six groups:

1. Cost of handling new security issues.

2. Cost of servicing outstanding securities of A. T. & T. Co.

3. Cost of handling funds in making advances sought by associated companies.

4. Cost of financing general department of A. T. & T. Co.

5. Cost of handling employee stock plan.

6. Cost of advising associated companies and long lines in their treasury work.

(R., 4227-55; 214).

The definitions of the nature of these various group expenses was also given by Mr. Blair-Smith (R., 44227-55). Groups 1, 2 and 4 are so clearly holding company operations that they should not need further comment. Group 3 is a cost which is directly comparable to the cost of operating a bank and the amounts naturally should be eliminated inasmuch as the associated companies pay interest on all of these loans. To permit these charges as license contract costs would simply amount to allowing additional interest without showing it as such. Group 5 represents the cost of distributing A. T. & T. stock to the employees of the Bell system under the employees' stock plan. Group 6 is obviously the only recognizable expense which should be allocated to the license contract service. In spite of the definitions of these various activities by Mr. Blair-Smith, Mr. Heiss took the totals of all these amounts, allocated approximately 6% to holding company operations and distributed the balance of approximately 94% between long lines and the associated companies. (Heiss Exhibit, A-154-B, R., 8806).

The commission in its discussion of this topic points out that the cost of these various groups within this department, with the possible exception of Group 6, are

entirely for the benefit of the American company and are not proper charges against the operating company and therefore disallowed all items charged for under the headings: direct distribution of securities, servicing securities, handling funds and making advances, financing general department and handling employees' stock plan. The balance of the costs as claimed by the company in this department were allowed by the commission (R., 214).

Personnel Department.

The commission disallowed a portion of the cost of the personnel department as contended for by the company. It expressed the reason for so doing in the following language. (Commission opinion, January 16, 1934, R., 212-3):

> "It appears to us that the scope of the work of this department is rather in the interest of the holding company than that of the licensee and the cost thereof not proper charges against the rate payer of the operating company, but considering that the state has admitted the propriety of some of the items and objected to others, we are disposed to adopt the state's figures and disallow those items set forth by the state in Appendix D of its brief, consisting of the following: Special training A. T. & T. Co., employees, 'other' items shown in Column 4, Exhibit A-150-B, public relations, 'other' items shown in Column 4, Exhibit A-151-B and interest on employees' benefit fund, Exhibit Heiss No. 10 Supl. The items so disallowed for the years 1925 to 1931 inclusive are set forth in Appendix 'I' hereto attached. The remaining items of cost in the personnel department will be allowed as claimed."

In deposition Exhibit 193 (R., 9304), Mr. Edwin F. Carter, head of the department, allocated a proportion of the expenses of this department to "other activities." In other words, Mr. Carter himself did not consider them allocable to the licensee companies. However, in this, as in some other departments, Mr. Heiss, exercising his judgment, picked up all these amounts and reallocated them on the basis of 10% to non-license and 90% to license contract services (Heiss Exhibit A-150-B, R., 8802). Granting these are judgment allocations, it is believed that the head of the department involved is more properly able to determine what should be charged to licensee companies than the comptroller, unless it be for the sole purpose of attempting to justify the license contract charges. And finally, upon the basis of the testimony introduced (R., 3344-5), we submit that the entire scope of its work is in the interests of the holding company and very properly could have been disallowed in its entirety.

Comptroller's Department.

The commission, in discussing this particular department, says (commission opinion, January 16, 1934, R., 214-5):

> "This department deals largely with statistics, general books and records and reports and we are inclined to the view that these activities are rather those pertaining to the holding company than to the operating companies. However, the state concedes the propriety of some of the charges as proper items of expense and we therefore adopt the state's posi-

tion in allowing part and disallowing other items. The figures disallowed are those set forth in Appendix D of the state's brief consisting of the cost pertaining to the following functions of that department: general books and records, chief statistician, Bell system reports, and proportion of subheads 'undistributed' and 'administration' appearing in Exhibit A-155-B. The items so disallowed are shown on Appendix 'I' hereto attached. All other items included in said department costs consisting of Bell system methods, chief traveling auditor, chief accountant and proportion of subheads 'undistributed' and 'administration' are allowed. The items so allowed for the respective years appear in Appendix 'H' hereto attached."

Mr. Heiss' final allocations for this department for the years involved is set forth in Exhibit A-155-B (R., 8808). Mr. Heiss defines the functions of his own department (R., 3348-50). The fact is that Mr. Heiss' allocations would carry greater weight had they been uniform in their application to the various rate cases in which the Bell companies have been involved in the different states, but it is a fact that Mr. Heiss presented different allocations in Ohio, Michigan and Illinois.

III.

THE CONTENTION OF THE COMPANY AS TO "REFUNDS IMPROPERLY ORDERED."

It is the claim of the company that the commission has erroneously ordered it to refund to the telephone subscribers of Ohio entitled thereto the sum of $11,832,264.

In its order of January 16, 1934, the commission determined that the company had earned excess earnings over the period involved of $13,289,172 as a result of its intrastate operations, toll and exchange. However, the commission recognizing that under the laws of Ohio it probably could not require the company to repay to its subscribers in those areas where no protests had been filed to the increase in telephone rates, the amount of the excess payments to which they were entitled, deducted from the total excess earnings found by the commission the amount allocable to those communities aggregating $1,121,494.

The court will remember that under the law as it existed at the time of the institution of the various proceedings before The Public Utilities Commission involving an increase in the rates of The Ohio Bell Telephone Company in some forty-three Ohio communities, the company was permitted to put the increased rates into effect over the protest of the community concerned upon the giving of a bond guaranteeing the repayment to the subscribers of any excess rates collected thereunder if it

were subsequently determined that such rates were excessive, and the court will further remember that if no protests were filed the rates became effective in due course and in the opinion of the commission a refund could not be ordered because of the fact that no bond had been required to be given by the company, so that when the commission came to the consideration of the distribution of the $13,289,172 in excessive earnings collected by the company during the period involved it was confined to distributing this fund, or the proper proportion thereof, to those communities which had filed protests to the company's increased rates.

It has been pointed out heretofore in this brief that in 1924 there were some forty-three separate rate cases involving The Ohio Bell Telephone Company pending before the commission. At that time it was determined that all of these cases should be consolidated into a state-wide case for the purpose of determining the fairness of the rates being collected by The Ohio Bell Telephone Company. That was done and for approximately ten years the case proceeded before The Public Utilities Commission of Ohio as a state-wide inquiry into the rates of The Ohio Bell Telephone Company. When, on January 16, 1934, and in the findings subsequent thereto, the commission reached its determination that the company had been collecting excessive rates over the entire period involved and ordered the refunds to which reference has been made, the company insisted that for the purpose of determining the parties entitled to these refunds the commission should now retrace its steps and have introduced

before it evidence as to the value of the property and the revenues and disbursements of each separate community for the purpose of determining whether or not the rates earned in that particular community had been excessive. In other words it was the contention of the company that substantially all of the evidence which had been produced before the commission over a period of ten years should be junked and the commission should start anew with the consideration of the valuation of the property for each separate exchange at approximately the same place where the commission had left off in 1924 when the separate causes were consolidated into a state-wide case.

The commission frankly recognized that this method of determining the proper amount of refunds allocable to each community and to each telephone exchange was one method by which the amounts of these refunds could be determined, but the commission did not feel that this was the only method by which this could be done, and the commission was of the opinion that the delays that would be necessarily incurred by the application of the method urged by the company would be intolerable. It therefore approached the allocation of the refunds to the various communities entitled thereto upon the basis of its findings of excessive earnings accruing to the telephone company for the period involved in the following manner:

The question of allocation pertained first to the amounts applicable to exchange service and to toll service, and second, to the subdivision of the amount applicable to exchange service as between those exchanges where the rates had become effective without protest and those exchanges where protests had been lodged.

The commission decided that it would apply the entire refund in each year first to the reduction of exchange rates to the extent that such rates were covered by bond, and second, to the reduction of toll rates in those years where excessive earnings exceeded the amount of the exchange service bonds. Only one basis of allocation was found in the entire record upon which any allocation could be made affecting all of the exchanges in the entire territory served by the company during each of the years for which excessive earnings were found, and this basis was the amount of exchange service revenues received in each of the exchanges during each of the years. (R., 3797-9.) The commission was not satisfied that this basis, representing as it does the gross revenues of each exchange, would correctly measure the amount to be refunded to patrons paying excessive rates and that for those patrons the amounts collected under bond would provide the more reliable measure upon which refunds should be ordered. (R., 3797.) However, as bonds were only filed for those exchanges in which the rates were protested, this basis of allocation could only be used after first allocating the proportion of the excessive return to the protesting exchanges as distinct from the non-protesting exchanges. The preliminary allocation was therefore made between the protesting and non-protesting groups of exchanges on the basis of gross exchange revenues. (R., 3797.) This resulted in classifying $11,832,264 or 89.04% of the total excessive return as being refundable. The portions of this amount as they applied to each of the protesting exchanges in each of

the years was then compared with the annual amounts collected under bonds and by taking the lower amount for each year it was found that $11,423,137 was refundable in the protesting exchanges, leaving $409,127 of refundable revenues not allocable to protesting exchanges for the entire period. This $409,127 represented an excessive return of $232,282 in 1925 and $176,845 in 1926, and as both of these amounts were less than the total bond posted by the company for these years, the commission applied this against excessive toll earnings for those years.

When it is considered that the company is excused from paying $1,456,908 of the excessive earnings found by the commission to have been collected by it under bond in protesting exchanges for the reason that under the commission's interpretation of the law as it then existed only those communities were entitled to refunds which filed protests to the company's increased rates, and when it is considered further that the communities entitled to these refunds, with but one exception, have accepted without question the commission's method of allocating the refunds to the respective communities, we can see but little merit in the company's contention that the method was erroneous. We recognize of course the company's desire to overthrow this method of allocation in order that the matter may be referred back to the commission for further extensive hearings of long duration for the purpose of allowing the company to retain these excessive earnings for an unknown future period,

but we can conceive of little justification for the adoption of such a procedure.

In its brief, the company addresses its complaint against the commission's method of apportioning the excessive rates found by the commission to have been collected from telephone subscribers in the state of Ohio during the period involved to the various telephone exchange areas, by the use of factors other than separate findings as to the property value and net income for each exchange concerned. To have followed the procedure, as urged by the company, would have resulted in the institution of some forty-three or forty-four separate rate cases and the discarding of substantially all of the work that was done in connection with the state-wide case. The delay involved by so doing would have been intolerable. (R., 3714.)

Aside from the company's desire to open up separate rate cases for each exchange, it showed little, if any, willingness to introduce evidence of any kind pertaining to the individual exchanges for the purpose of determining the amount of refunds apportionable to each such exchange. So the only evidence introduced into the record on this question was as a result of the commission's orders of January 16, 1934 (R., 154-247) and March 1, 1934 (R., 273), and is contained in data furnished by the company on April 17, 1934. (R., 8425.)

Testimony produced in respect to such data reveals the company's unwillingness to enter into any discussion of a proper method of allocating the excessive revenues

found by the commission to have been collected by the company (R., 37, 91-96).

The company, in its brief, discusses repeatedly the evils occurring from the use of gross exchange revenues as the basis of allocating the refunds to the subscribers involved in this case. However, in reallocating refunds on what it deems the "commission's theory" wherein an alleged excessive refund of $4,640,364 is developed (Brett Ex. 9; R., 6347), the company has used gross exchange revenues exclusively as an allocation base. The method adopted by the commission as explained in the record (R., 3798-3799) and by Wood Exhibits 21 and 22 (R., 8193 and 8200) was not thus confined. It involved two steps, the first step being based upon gross exchange revenues for the group of exchanges entitled to refund and for the group of exchanges not entitled to refund. In this step, the total excessive return of $13,289,172 as found by the commission was separated upon the basis of $11,832,264 to the group of protesting exchanges and $1,456,908 to the group of non-protesting exchanges (Wood Exhibit 22; R., 8200). While the company criticises this step, its witness on the subject could offer no substitute method for it (R., 3791).

Prior to adopting the above-described method of allocation of refunds as between protesting exchanges and non-protesting exchanges, the commission had allocated $12,187,443 to the protesting exchanges and $1,101,729 to the non-protesting exchanges, based upon the hypothetical rate structure filed by the company (R., 3711-3738, 3746). However, the gross exchange revenue basis which

resulted in a lesser allocation to protesting exchanges and thus a reduction of the total amount refundable by the company was finally adopted by the commission as the first step in the proper allocation of the company's excessive earnings to those exchanges entitled thereto.

Having found a total of $11,832,264 in excessive rates collected by the company and applicable to the entire group of protesting exchanges wherein such rates have been collected under bond, in the manner previously described, the second step taken by the commission, required the allocation of this amount to the various exchanges entitled thereto. Now while the allocation on a gross exchange revenue basis, as used in the first step hereinbefore described, was considered reasonably accurate when applied to a broad base and where the law of averages could operate (R., 3753), it was recognized that it would not apply with the same degree of equity and accuracy where the base was narrowed to individual exchanges, wherein there existed the varying conditions described in appellant's brief (p. 69). For this reason, a basis of allocation in the second step was employed which gave weight to the varying amounts of bonded increases as between different classes of rates and different sizes of exchanges; to the relation which the increased rates bore to the pre-existing rates; to the character of the several exchanges furnishing the service, and to the cost of rendering that service. This basis was found in the amounts reported by the company as collected under bond in the various protesting exchanges.

This method also automatically limited refundable por-

tions of the excessive return for each exchange in each year to amounts not in excess of the total collections under bond in each exchange during each year. (R., 3768 and 3769.) In cases where such allocations exceeded such amounts collected under bond within an exchange area only the latter amount was considered refundable within such exchange area. Thus, of the total excess return of $11,832,264 in protesting exchanges only $11,423,137 was found to be refundable within such exchanges, leaving unapplied differences of $232,282 in 1925 and $176,845 in 1926. This total difference of $409,127 had not been collected under bond within any exchange area but nevertheless it represented excessive return to the company in those years and inasmuch as the company's statement showed excess collections had been made under bond for toll service of $510,142 in 1925 and $548,088 in 1926 the commission considered these differences of $232,282 in 1925 and $176,845 in 1926 as refundable toll revenues for those years.

Inasmuch as there is no localization of toll revenues as there is of exchange revenues, the excess toll revenues are state-wide in nature and are not subject to allocation geographically. The fact that the amount thereof was determined as a residue figure instead of by direct computation, diminishes rather than increases the total refundable amount. The commission considered refunds as being applicable first to exchange service patrons and second to toll service patrons, (R., 3774) but had it taken a reverse position and applied the toll service refund to the extent of collections under toll service bonds, the

amount of collections under such bonds of $4,981,394 would first have been refunded. The residue of the excessive return of $8,307,778 would have been allocated between protesting (approximately 89%) and non-protesting (approximately 11%) exchanges instead of the $13,289,172 that was so allocated. This would have resulted in a smaller amount applicable to non-protesting exchanges and consequently a smaller amount found to be non-refundable. But the refundable portion of the total excessive return of $13,289,172, consisting of $4,981,394 toll plus the reduced portion applicable to protesting exchanges (approximately $7,393,922) would have exceeded the $11,832,264 ordered refunded by over $500,000.

The company enters into a series of computations in its brief (pp. 70-71) by virtue of which it claims that had the commission eliminated non-bonded exchange service revenues in the Cleveland exchange from the allocation base used in the first step of its calculations, the results would have been to reduce the total refundable amount by more than $4,000,000. However, the company avoids carrying this argument beyond the Cleveland exchange. If it were proper to eliminate non-bonded revenues in Cleveland, would it not be equally proper to eliminate all non-bonded revenues in all protesting exchanges? If this were done, what would the result be? The answer is apparent. It would have to result in an allocation base for all protesting exchanges equal to the total bonded revenues in all protesting exchanges or $14,887,674 for the entire period from 1925 to 1932 both inclusive. And what use could be made of this figure in making the first

step of the allocation? There is no corresponding figure for non-protesting exchanges with which it could be compared or used for allocation purposes. (R., 3772, 3750, 3751.) The company's witness could suggest no available evidence in the record aside from gross exchange revenues that could be used in making allocations under the first step. (R., 3791.)

The figures purporting to be computed by the "Commission's Method" as shown in the company's brief (Column 7, p. 71) constitute a perversion of facts which the company persists in repeating with the inference that they are the commission's figures. Nowhere did the commission arrive at these figures and nowhere did they use them in arriving at their conclusions. They were first devised in Brett Exhibit No. 9, sheet No. 9 (R., 6356) in an amount of $5,467,766 wherein the percentages used by the commission in its first step were applied by the company in reworking the commission's second step on what the company chose to term the "Commission's Theory carried through to Conclusion on Basis of Original Method". They were referred to witness Wood for examination (R., 3798-9) and were commented upon by him in his report of August 11, 1934 (R., 8200) which contains quite complete explanations and points out further that in "carrying through to a conclusion" the company was not consistent in respect to toll refunds which would have been increased by $3,813,243 under their modified application of the commission's method. The company's whole point has been to pick out the gross exchange revenue percentages, which it

elsewhere severely criticizes as a base, that were used by the commission in the first step of its allocations, and to apply such percentages regardless of theory to all steps in the allocations, disregarding changes in residue toll figures resulting from such methods and then coming up with a set of hybrid figures which it infers are computed by the "Commission's Method". The excess earnings attributable to Cleveland as actually computed by the commission's method are as follows (Commission's Order of September 6, 1934, Schedule A; R., 378-9):

Year	Increases Collected Under Bond	Refundable Portion Collected	Excess Earnings Found Refundable
1925	86,717	100.00000%	86,717
1926	92,976	100.00000%	92,976
1927	99,160	95.59084%	84,788
1928	102,841	88.52068%	91,036
1929	113,937	62.67606%	71,411
1930	118,367	62.12778%	73,539
1931	115,487	73.06314%	84,378
1932	108,515	46.34134%	50,287
Totals	838,000		645,132

The record discloses that when the results of the method of allocating refunds as used by the commission were checked against the schedule of hypothetical rates submitted by the company on the order of the commission (R., 8425), carrying into effect the reduction in revenues found by the commission to be excessive they were substantially the same. (R., 3799, 8193, 8200.)

IV.

APPELLANT'S FINANCIAL EXPERIENCE.

Upon the basis of the commission's findings the appellant's book surplus at November 30, 1933 would be $10,682,929 after the payment of that portion of its excessive earnings found by the commission to be refundable to its subscribers in the amount of $11,832,264 while at the same time its reserve for depreciation would have been $14,652,468 instead of $21,999,901 as shown by the company's books. In other words, at November 30, 1933 the appellant should have had a book surplus of $22,515,193 with a reserve for accrued depreciation of $14,652,468. That the appellant has seen fit to deplete its surplus by excessive credits to its depreciation reserve in addition to excessive payments to American Telephone & Telegraph Company and Western Electric Company should not mislead any careful student of the facts.

Appellant states, in its brief (pp. 13 and 78) that its surplus was reduced approximately $1,000,000 between June 30, 1925 and November 30, 1933, and that the balance of the surplus account at the latter date was $2,813,345 from which it was ordered by the commission to pay the refund of $11,832,264 with interest. The period for which this refund applies is 1925 to 1932 inclusive and the commission, as has been discussed in previous chapters of this brief, determined that the gross income of the company during the period should have been $19,701,848 greater than the amount shown by the records of the company. The items comprising this total are detailed in lines 12, 13, 14 and 15 of Table 2:

Excessive Licensee payments	$2,870,218
Excessive Depreciation	16,115,738
Excessive Amortization	432,815
Excessive Western Electric prices	283,077
Total 1925-1932 inclusive	$19,701,848

Of the above amount, $13,289,172 represented excessive earnings but, as stated heretofore (pp. 128-131) only $11,832,264 was ordered refunded with interest. The understated net income (line 18) was therefore $7,869,584. Upon the basis of the findings of the commission as to license contracts, the proper rate of depreciation, and fair Western Electric prices, the company would have had on November 30, 1933, a surplus of $19,701,848 greater than the book surplus of $2,813,345 from which to pay the refund as ordered by the commission and still leave a net increase in surplus of $7,869,584 or a book surplus of $10,682,929 at November 30, 1933.

This deficiency in net income concerns only the items having a direct bearing upon the determination of rates for telephone service. Other items with which the commission was not concerned have contributed to a considerable extent to the decrease in surplus commented upon above by the company. Such items were purely the result of financial policies beyond the jurisdiction of the commission in regulating rates and its responsibility for their effect upon the company's surplus should not be inferred. For example, there were losses of over $3,000,000 on sundry items, representing principally the loss on preferred stock redeemed, the retirement of underlying bonds, the loss of purchased companies assumed, etc. (Wood Exhibit 4; R., 8179.)

TABLE II

	1925	1926	1927	1928	1929	1930	1931	1932	Total	
Intrastate:—										
1. Revenues	29,127,777	31,939,353	34,269,380	37,688,198	41,673,966	32,304,400	40,709,639	35,722,026	293,306,739	R. 8363
2. Expenses	23,171,103	25,271,407	27,058,031	29,182,575	33,520,373	34,287,243	32,725,410	28,683,150	234,199,292	R. 8363
3. Net Income	5,956,674	6,667,946	7,202,349	8,205,623	8,153,593	8,017,157	8,065,229	7,038,876	59,307,447	
As Found By Commission:										
Intrastate:—										
4. Revenues	29,860,295	32,621,359	35,091,386	38,0887645	41,849,739	42,405,306	40,884,960	35,745,348	296,376,958	R. 236-237
5. Less, Excessive Return	1,822,647	2,041,483	1,986,610	1,925,301	1,463,347	1,481,689	1,659,760	908,235	13,289,172	R. 244
6. Adjusted Revenues	28,037,598	30,579,876	33,014,776	36,083,344	40,386,392	40,923,617	39,225,200	34,836,993	283,087,786	
7. Expenses	21,478,044	23,456,132	25,242,219	27,514,103	30,952,802	31,454,219	29,782,552	27,487,582	217,367,663	R. 236-237
8. Net Income	6,559,524	7,123,744	7,772,557	8,569,241	9,433,590	9,469,398	9,442,648	7,349,411	65,720,123	R. 244
Difference in Intrastate Net Income:										
9. Line 8 minus Line 3	602,850	455,798	570,208	363,618	1,279,997	1,452,241	1,377,429	310,535	6,412,676	
Add, Excessive Return not refundable										
10. Exchange Service Revenues	433,170	227,324	162,753	153,063	118,723	124,100	140,355	77,420	1,456,908	Wood Exhibits 21-22
Total Difference Intrastate Net Income:										
11. Understated Net Income (Lines 9 and 10)	1,036,020	683,122	732,961	516,681	1,398,720	1,576,341	1,517,784	387,955	7,869,584	
Analysis of Understated Net Income:										
12. Excessive Licensee Payments	732,428	682,096	741,005	329,447	175,773	100,906	94,351	23,302	2,870,218	Intrastate percentages
13. Excessive Depreciation	1,635,563	1,756,299	1,757,276	1,908,980	2,520,223	2,758,913	2,744,479	1,034,985	16,115,738	shown in R. 243 ap-
14. Excessive Amortization	57,506	58,976	58,537	60,472	47,348	51,776	50,339	47,861	432,815	plied to total figures on
15. Excessive Western Electric Prices	.....	.....	.....	.....	.....	22,335	148,029	112,722	283,077	lines 19 to 22 below
16. Total Excessive Charges	2,425,497	2,497,281	2,556,818	2,298,919	2,743,344	2,933,930	3,037,199	1,218,870	19,701,848	
17. Less, Subscribers' Refunds ordered	1,389,477	1,814,159	1,823,857	1,772,238	1,344,624	1,357,589	1,519,405	830,915	11,832,264	
18. Understated Net Income	1,036,020	683,122	732,961	516,681	1,398,720	1,576,341	1,517,784	387,955	7,869,584	
Total Excessive Charges:										
19. Excessive Licensee Payments	751,975	703,387	765,739	331,626	182,583	104,555	98,047	23,973		R. 238—lines 7-8 and 15-16
20. Excessive Depreciation	1,682,354	1,810,102	1,820,433	1,983,073	2,633,250	2,883,043	2,883,538	1,083,904		R. 8178—L. 11 minus R. 242—L. 17 and 34
21. Excessive Amortization	59,293	60,577	60,346	62,721	49,934	54,740	53,374	50,230		R. 8175—line 35
22. Excessive Western Electric Prices	.....	.....	.....	.....	.....	23,208	154,284	117,028		R. 236 and 237

An important fact that must be constantly borne in mind in the consideration of this case is the ownership by American Telephone and Telegraph Company, either directly or indirectly, of more than ninety percent of the combined voting stock of the twenty-four companies associated with it as the Bell System. The American Company also owns ninety-eight percent of the Western Electric Company. It owns all of the stock of the Bell Telephone Securities Company and it has varying interests in other affiliated companies. (R., 6774.)

Under such circumstances excessive payments made by the appellant to the American Company for license services as well as payments to the Western Electric Company for its telephone equipment at excessive prices must be construed as merely diverting income from one member of an affiliated group to another member thereof and the adverse showing in the recorded surplus of The Ohio Bell Telephone Company is, of necessity, offset by an increase in the earnings and surplus of other members of the affiliated group.

An example illustrative of the ease with which intercompany profits in the American System may be earned was more fully discussed under the chapter on depreciation. There it was stated that the American Telephone and Telegraph Company sold to the operating companies telephone instruments for $14,395,800 in excess of book value and this amount was added to its surplus account. The portion of the profit on these instruments charged to The Ohio Bell Telephone Company and capitalized was $595,986.

As stated in Appendix M of the commission's order of January 16, 1934 (R., 244) the rates of return allowed on present value were as follows: 1925-1929 inclusive, 7%; 1930 and 1931, 6½%; 1932 and 1933, 5½%. The rates actually realized by the company upon the basis of the commission's findings on its intrastate business during these years were as follows: 1925, 8.95%; 1926, 9.01%; 1927, 8.79%; 1928, 8.57%; 1929, 8.09%; 1930, 7.52%; 1931, 7.64%; 1932, 6.18%; 1933, 5.51%. The average for the nine-year period was 7.71%. The average reasonable rate determined by the commission for the same period was 6.5%. The reasonableness of the rates of return allowed by the commission is not challenged by the company, but in connection with the financial experience of the company it is of interest to appraise the company's earnings in the perspective of the entire American System. For example, David F. Houston, president of the Bell Securities Company, which is owned entirely by the American Company, stated in 1922 that in order for the American Company to pay dividends of 9%, the operating companies need earn only 4.7% on their investment, due to the high degree of cooperation possible in such a system. (R., 6774.) During the years immediately following Mr. Houston's statement, the surplus of the American System increased 62%. (R., 6776.) Clearly, he had in mind the fact that the Western Electric Company manufactures equipment used by the operating companies and bills these companies at prices including substantial profits and the operating companies pay to the American Company certain percentages of their

gross income under the caption of license payments treated as expenses by the operating companies. The earnings of The Ohio Bell Telephone Company are distributed to the American Company in the form of dividends. These dividends, when declared and paid, are charged against The Ohio Bell Company's surplus. If, in 1933, the latter's surplus was badly depleted as claimed by the company and since the dividend policy of The Ohio Bell Company has been determined and fixed by the American Company, the latter company might now be expected to refund a portion of the excess payments made either in the form of dividends, license payments, excessive Western Electric prices, or the profit made from the sale of telephone instruments.

As stated in the chapters entitled "Depreciation", the reserve for depreciation at December 31, 1933, was $21,999,901. The percent condition, as determined by the commission, was 91.21% which would indicate that a reserve of $14,652,468 would be ample and that the company's reserve was $7,347,333 excessive. In making the proper adjustment of this depreciation reserve, this amount would be credited to the company's surplus partially offsetting the charge for refunds.

The fact is, as stated in the chapters on "Depreciation" and "License Contracts", that the company in 1933 was using substantially the same rates as those prescribed by the commission in determining excessive earnings for this nine-year period. The depreciation rate voluntarily adopted by the company in 1933 was 4.18%. The commission prescribed 4%. The Ohio Bell Telephone Com-

pany was paying the American Company 1½% of its gross revenue for license payments. The commission made no reduction in this item. How can the company, in light of its own voluntary action adopting these rates, charge the commission with confiscating its property? In the chapter on "Depreciation" if was definitely established that the company failed to record $9,919,920 of depreciation reserves on property purchased and that the company charged excessive rates during the period of abnormal replacements in order to accumulate sufficient balances in their reserves to absorb these abnormal charges.

The commission has clearly demonstrated from the facts in this record that the earnings of The Ohio Bell Telephone Company from 1925 to 1933 were excessive. The company furnished bond at the beginning of this rate study that all earnings determined to be excessive would be refunded. It now takes the position that its surplus account is depleted as a result of excessive dividend payments to the parent company and will not stand the charge of the refund payments. Prudent accounting would have resulted in a reserve adequate to meet this payment instead of the $2,500,000 which the company in 1933 carried in its balance sheet for this purpose. The statement that the company is now unable to make this payment must be branded as pure fiction.

CONCLUSION.

The judgment of the Supreme Court of Ohio, affirming the orders of The Public Utilities Commission of Ohio, should be affirmed.

Respectfully submitted,

HERBERT S. DUFFY,
Attorney General of Ohio,
A. F. O'NEIL,
W. W. METCALF,
Assistant Attorneys General of Ohio,
Counsel for Appellee.

DONALD C. POWER,
Special Counsel,
For Appellee.
March 27, 1937.

APPENDIX.

Pence Law, p. i.
Valuation Sections, Ohio General Code, p. v.
Section 614-23 of the General Code, p. x.

Pence Law.

The Pence Law, Section 614-20, passed April 4, 1923, 110 Ohio Laws, 366, which amended the Robinson Law, is as follows:

> "Unless otherwise ordered by the commission, no change shall be made in any rate, joint rate, toll, classification, charge or rental in force at the time this act takes effect, or as shown upon the schedules which shall have been filed by a public utility in compliance with the requirements of this act, or by order of the commission, except after thirty days' notice, in writing, to the commission, which notice shall plainly state the changes proposed to be made in the schedule then in force, and the time when the change, rate, charge, toll, classification, or rental shall go into effect; and all proposed changes shall be plainly indicated upon existing schedules, or by filing new schedules thirty days prior to the time when they are to take effect, but the commission may prescribe a less time when they make take effect, provided, however, that if the proposed change shall effect an increase in the rate, joint rate, toll, classification, charge or rental, notice, in form approved by the commission, published once each week for three consecutive weeks before the effective date thereof, unless the commission shall authorize a less time, shall be given by publication in a newspaper published at the county seat of each county in which such change applies, and of general circulation therein, or in one newspaper published in, and of

general circulation throughout the territory in which such utility operates. Such published notice shall set forth the fact that such application has been made, the effective date of the proposed new schedule, the name and location of the agent of the utility in such county or territory where a copy of such proposed new schedule may be inspected by any interested party; and provided, further, however, that such utility shall at the time of the filing of the schedule with the commission, place on file with such agent of such utility a copy of the proposed new schedule and keep the same on file for the inspection of any interested party pending the hearing before such commission.

Whenever there shall be filed with the commission any schedule effecting an increase in any rate, joint rate, toll, classification, charge or rental, or stating any new regulation or practice affecting any existing rate, joint rate, toll, classification, charge or rental in force at the time this act takes effect, the commission shall have, and it is hereby given authority, either upon complaint, or upon its own initiation without complaint, at once, and if it so orders without answer or other form of pleading by the interested public utility, but upon reasonable notice, to enter upon a hearing concerning the propriety of such rate, joint rate, toll, classification, charge, rental, regulation or practice; and pending such hearing and the decision thereon, the commission upon filing with such schedule and delivering to the public utility affected thereby, a statement in writing of its reasons for such suspension, shall suspend the operation of such schedule and postpone the use and operation of such rate, joint rate, toll, classification, charge, rental, regulation or practice, but not for a longer period than one hundred and twenty days from the time when such schedule was filed with the commission; and after a full hearing, whether completed before or after the rate, joint rate, toll, classification, charge, rental, regulation or practice goes into effect,

the commission may make such order in reference to such rate, joint rate, toll, classification, charge, rental, regulation or practice as would be proper in a proceeding initiated after the rate, joint rate, toll, classification, charge, rental, regulation or practice had become effective; provided, that if any such hearing cannot be concluded within the period of suspension, as above stated, such rate, joint rate, toll, classification, charge, rental, regulation or practice shall go into effect at the end of such period of suspension upon the public utility filing with the commission a bond, undertaking or other security, to the satisfaction of the commission, securing and guaranteeing the repayment, with interest at the rate of six per centum per annum from the date of payment by the consumer to the date of repayment by the utility, to all the consumers of such portion of such increased rate, joint rate, toll, classification, charge or rental, collected by such utility as the commission, upon final hearing, may determine to have been unreasonable or excessive, which repayments shall be made at such times and in such amounts as the commission shall order, and shall be promptly paid by said utility to the corporations or persons entitled thereto, and in such manner as the commission may prescribe, and if any such money ordered by the commission to be repaid shall not have been claimed by the corporations or persons entitled thereto, within one year from the time the same shall become due and payable in accordance with the order of the commission, all such moneys shall be paid by the utility to the treasurer of the county, or other political subdivision, in which such new schedule is effective for the benefit of its general fund, in such amounts and in such manner as the commission may order; and thereafter such public utility shall not be liable therefor. Such bond, undertaking or security shall be in such amount as the commission may from time to time determine; provided, however, that the amount fixed at any time shall not, in addition to the amount of such increase

or other charge made by the utility already accrued, exceed the estimated amount of such increase or other charge made by the utility extending over a period of one year, based upon the business of the utility for the previous year, or be less than one-half of such estimated amount.

All rates, joint rates, tolls, classifications, charges or rentals of a public utility heretofore or hereafter fixed and determined by any order the commission under the provisions of this chapter shall be in force and be prima facie lawful for two years from their effective date or until changed or modified as provided by law, provided, however, that after any such rate, joint rate, toll, classification, charge or rental shall have been in force for a period of two years, the same may be changed by the public utility affected in the manner provided in this section; and that nothing herein contained shall be construed as in any way affecting the right of any person or public utility to make application, as provided in Sections 614-21 and 614-23 of the General Code or otherwise as provided by law, for an order rescinding, altering or amending any order of the commission within said two-year period or thereafter.

At any hearing involving a rate increased or sought to be increased after this section shall have become effective, the burden of proof to show that the increased rate or the proposed increased rate is just and reasonable shall be upon the public utility and the commission shall give to the hearing and decision of such question, preference over other questions pending before it, and decide the same as speedily as possible."

Valuation Sections, Ohio General Code.

Sec. 499-8.

The commission, for the purpose of ascertaining the reasonableness and justice of rates and charges for the service rendered by public utilities or railroads of this state, or for any other purpose authorized by law may investigate and ascertain the value of the property of any public utility or railroad in this state, used or useful for the service and convenience of the public. At the request of the council of any municipality the commission after hearing and determining that such a valuation is necessary may also investigate and ascertain the value of the property of any public utility used and useful for the service and convenience of the public where the whole or major portion of such utility is situated in such municipality. Every public utility or railroad shall furnish to the commission, its engineers, experts or other assistants from time to time and as the commission may require maps, profiles, contracts, reports of engineers and other documents, records and papers or copies of any or all of the same, in aid of any investigation and ascertainment of the value of its property, and shall grant to the commission or its agents free access to all of its premises and property and its accounts, records and memoranda whenever and wherever requested by any such duly authorized agent, and every public utility or railroad is hereby directed and required to co-operate with and aid the commission in the work of the valuation of its property in such further particulars and to such extent as the

commission may require and direct. The commission shall have such power to make all rules and regulations, as to it may seem necessary, to ascertain the value of each and every utility or railroad in the state. (106 v. 225; 103 v. 808, §21.)

Sec. 499-9.

The commission shall prescribe the details of the inventory of the property of each public utility or railroad in the state; and such inventory shall include all the kinds and classes of property, with the value of each, owned by each public utility or railroad, used and useful for the service and convenience of the public. In ascertaining the value of the various kinds and classes of property of each public utility or railroad, the commission shall have authority to ascertain and report in such detail as it may deem necessary as to each piece of property owned or used by such public utility or railroad to show separately the following facts:

A. The original cost, if any, of each parcel of land owned and used by such public utility or railroad, and a statement of the conditions of acquisition; whether by direct purchase, by donation, by exercise of the power of eminent domain or otherwise.

B. The value as of a date certain, of each parcel of land owned and used by such public utility or railroad, by comparison with the value of contiguous and neighboring parcels of land, and land of similar character as to location and use.

C. If there shall be any additional value to such utility or railroad by reason of the ownership by it of one or

more parcels of land and its use as a continuous right of way for transportation purposes, or for other purposes, such additional value shall be separately and specifically set forth for each parcel.

D. The cost of new production as of a date certain, of all physical property other than land, owned and used by such public utility or railroad, showing the values of the separate items comprising such property, together with the unit basis of such valuation.

E. Depreciation, if any, from the new reproductive cost as of a date certain, for existing mechanical deterioration, for age, for obsolescence, for lack of utility or for any other cause, the percentage and amount of each class of depreciation, if any, to be specifically set forth in detail.

F. The net value as of a date certain, of all physical property other than land owned by such utility or railroad, to be derived by deducting the sum of the amounts of depreciation from the sum of the new reproductive costs.

G. If there shall be any additional value given to the value of the property of a public utility or railroad due to the possession of a franchise to perform a public service, or for good will or for financing, such additional value shall be separately and specifically set forth, together with the basis for the computation or estimate of such additional value.

H. A duplicate copy of the record of every physical valuation of a public utility or railroad shall be furnished to the Ohio tax commission, on request, for its use in

ascertaining the value of the property of such utility or railroad for purposes of taxation, and upon demand any person or corporation owning or operating a public utility or railroad shall be furnished with a copy of the valuation of his or its property.

Such investigations and report shall show separately the property used and useful to such utility or railroad in the furnishing of the service to the public, and the property held by such utility or railroad for other purposes, and such other items concerning values and methods of making valuations as the commission may deem proper; which said inventories and reports shall be filed in the office of the commission for the information of the governor and the general assembly. (103 v. 809, § 22.)

Sec. 499-10.

Such investigation and report shall also show whenever the commission may deem necessary, the amounts and dates and rates of interest of all bonds, outstanding against each public utility or railroad, the property upon which they are a lien, the amounts paid therefor; and, in such detail as may be necessary, the original capital stock and the moneys received by any such utility or railroad by reason of any issue of stock, bonds or other securities. Such report shall also show the net and gross receipts of such utility or railroad and the method by which moneys were expended or paid out and the purpose of such payments. The commission shall have the power to prescribe the method of procedure to be followed in making the investigation and valuation and the form in which the results of the ascertainment of the

value of each utility or railroad shall be submitted, and the classifications of the elements that constitute the ascertained value. Such investigation shall also show the value of the property of every public utility or railroad as a whole; and in case such utility or railroad has property in more than one county, the value of its property in each of such counties. (103 v. 810, § 23.)

Sec. 499-11.

The commission, during the making of the valuation herein provided for, and after the completion thereof, shall thereafter in like manner keep itself informed through its engineers, experts and other assistants of all extensions and improvements or other changes in the condition and value of the property of all public utilities or railroads and shall ascertain the value of such extensions, improvements and changes and shall from time to time, as may be required for the proper regulation of such public utilities or railroads, revise and correct its valuations of property, showing such revisions and corrections as a whole and as to each county in the state. Such revisions and corrections shall be filed in the same manner as is provided for original reports. (103 v. 811, § 24.)

Sec. 499-12.

The commission, whenever it shall have completed the valuation of the property of any public utility or railroad and before such valuation shall have become final, shall give notice by registered letter to such public utility or railroad, or if the whole or the major portion of said utility or railroad is situated in any municipality,

then to the mayor of such municipality, stating the valuations placed upon the several kinds and classes of property of such public utility or railroad and upon the property as a whole. If within thirty days after such notification no protest shall have been filed with the commission then said valuation shall be and become final. If notice of protest shall have been filed, however, by any public utility or railroad, the commission shall fix a time for hearing the same and shall consider at such hearing any matter material thereto presented by such public utility or railroad or municipality, in support of its protest or by any representative of the public against such protest. If after the hearing of any protest of any valuation so fixed, the commission shall be of the opinion that its inventory is incomplete or inaccurate or that its valuation is incorrect it shall make such changes as may be necessary and shall issue an order making such corrected valuations final. A final valuation by the commission and all classifications made for the ascertainment of such valuations shall be public and shall be prima facie evidence relative to the value of the property. (103 v. 811, § 25.)

Sec. 614-23 of the General Code of Ohio.

Sec. 614-23.

Whenever the commission shall be of the opinion, after hearing, that any rate, fare, charge, toll, rental, schedule, classification or service, or any joint rate, fare, charge, toll, rental, schedule, classification, or service rendered, charged, demanded, exacted or proposed to be rendered,

charged, demanded, or exacted, is, or will be, unjust, unreasonable, unjustly discriminatory or unjustly preferential or in violation of law, or the service inadequate, or that the maximum rates, charges, tolls or rentals chargeable by any such public utility are insufficient to yield reasonable compensation for the service rendered, and are unjust and unreasonable the commission shall, with due regard among other things, to the value of all of the property of the public utility actually used and useful for the convenience of the public, excluding therefrom the value of any franchise or right to own, operate or enjoy the same in excess of the amount, (exclusive of any tax or annual charge) actually paid to any political subdivision of the state or county, as the consideration for the grant of such franchise or right; and exclusive of any value added thereto by reason of a monopoly or merger and to the necessity of making reservation out of the income for surplus, depreciation and contingencies, and all such other matters as may be proper, according to the facts in each case, fix and determine the just and reasonable rate, fare, charge, toll, rental or service to be thereafter rendered, charged, demanded, exacted or collected for the performance or rendition of the service, and order the same substituted therefor; and thereafter, no change in the rate, fare, toll, charge, rental, schedule, classification or service, shall be made, rendered, charged, demanded, exacted or charged by such public utility without the order of the commission and any other rate, fare, toll, charge, rental, classification or service shall be deemed and held to be unjust and unreasonable, pro-

hibited and unlawful. Upon application of any person or any public utility, and after notice to the parties in interest and opportunity to be heard as provided in this act for other hearings, has been given, the commission may rescind, alter or amend an order fixing any rate or rates, fare, toll, charge, rental, classification or service, or any other order made by the commission. Certified copies of such orders shall be served and take effect as provided for original orders. (102 v. 556, § 25.)

SUPREME COURT OF THE UNITED STATES.

No. 539.—October Term, 1936.

The Ohio Bell Telephone Company, Appellant, *vs.* The Public Utilities Commission of Ohio, Appellee.	Appeal from the Supreme Court of the State of Ohio.

[April 26, 1937.]

Mr. Justice Cardozo delivered the opinion of the Court.

The rates chargeable by the appellant, the Ohio Bell Telephone Company, for intrastate telephone service to subscribers and patrons in Ohio are the subject-matter of this controversy.

Appellant was reorganized in September, 1921, by consolidation with the Ohio State Telephone Company, till then a competitor. Soon afterwards it filed with the Public Utilities Commission of the state schedules of new rates to be charged in those communities where an increase was desired for the unified service. Except in the case of toll charges the rates were not state-wide, but were separately stated for each of the company's exchanges, of which there were many. By the statutes then in force (the Robinson law, passed December 19, 1919, 108 Ohio Laws 1094, as amended by the Pence law, passed April 4, 1923, 110 Ohio Laws 366), the operation of an increase might be suspended for 120 days, at the end of which time the rate was to go into effect upon the filing of a bond for the repayment to consumers of such portion of the increased rate as the Commission upon final hearing should determine to have been excessive, with interest thereon. Construing these statutes the Ohio courts have held that a refund must be limited to rates collected under a bond, jurisdiction being disclaimed when that condition was not satisfied. *City of Lima* v. *Public Utilities Commission*, 106 Ohio St. 379, 386; *Great Miami Valley Taxpayers Assn.* v. *Public Utilities Commission*, 131 Ohio St. 285, 286. Some of the new exchange schedules were the subject of protests, and in proceedings to revise them (known as Pence Law proceedings) were made effective by bonds, a separate one for each exchange. Protest

was also aimed at the new schedule for toll service which was to apply throughout the state. On the other hand, schedules for other exchanges became effective without protest and therefore without bond, and are not now at issue.

By October 1924, thirty-one Pence law proceedings aimed at separate exchanges had been begun, but had not been fully tried. Already several thousand pages of testimony had been taken and many exhibits received in evidence. Soon afterwards, twelve additional proceedings were begun, making the total number forty-three, exclusive of the toll case. Two other proceedings were started later on. While the number stood at forty-three, the Commission of its own motion, by order dated October 14, 1924, directed a company-wide investigation of appellant's property and rates, and consolidated the bond cases therewith. The order recites that in all the pending proceedings the important issues are identical, and that a single consolidated case will enable rates to be determined for all services within the state at a minimum expenditure of time and money. Accordingly, the company was required to file with the Commission on or before December 1, 1924, a complete inventory of all its property, used and useful in its business, and upon the filing of such inventory, the consolidated case was to "proceed to a hearing for the determination of the fair value of said property and of the just and reasonable rates for the service thereby to be furnished by said company to its patrons throughout the state of Ohio." The state-wide investigation thus initiated, as distinguished from the Pence Law proceedings consolidated therewith, had its legal basis in provisions of the General Code of Ohio (section 499-8, 499-9), and its scope was confined to the rates chargeable in the future (Section 614-23), the Pence Law being the basis for any refund of rates collected in the past. The statute (section 499-9) makes it mandatory that in fixing rates for the future, the Commission shall ascertain the value of the property as "of a date certain" to be named. The date adopted for that purpose was June 30, 1925.

The company filed an inventory as required by the Commission with supplemental inventories every six months thereafter showing additions and retirements. A long investigation followed, the evidence being directed in the main to the value of the property on the basis of historical cost and cost of reproduction, and to the deductions chargeable to gross revenues for depreciation reserve and

operating expenses generally. As early as February, 1927, the case was submitted to the Commission for the fixing of a tentative value as of the date certain, a tentative value being subject under the Ohio Code to protest and readjustment. At the request of the Attorney General, however, the proceeding was reopened and new evidence introduced. At last, on January 10, 1931, the Commission announced its tentative conclusion. The valuation then arrived at was $104,282,735, for all the property within the state, whether used in interstate or in intrastate business. Protests were filed both by the company and by the state and municipalities. They were followed by new hearings. On January 16, 1934, the Commission made its findings and order setting forth what purports to be a final valuation. The intrastate property as of June 30, 1925, was valued at $93,707,488; the total property, interstate and intrastate, at $96,422,276.

The Commission did not confine itself, however, to a valuation of the property as of the date certain. It undertook also to fix a valuation for each of the years 1926 to 1933 inclusive. For this purpose it took judicial notice of price trends during those years, modifying the value which it had found as of the date certain by the percentage of decline or rise applicable to the years thereafter. The first warning that it would do this came in 1934 with the filing of its report. "The trend of land valuation was ascertained", according to the findings, "from examination of the tax value in communities where the company had its largest real estate holdings." "For building trends resort was had to price indices of the Engineering News Record, a recognized magazine in the field of engineering construction." "Labor trends were developed from the same sources." Reference was made also to the findings of a federal court in Illinois (*Illinois Bell Telephone Co.* v. *Gilbert*, 3 F. Supp. 595, 603) as to the price levels upon sales of apparatus and equipment by Western Electric, an affiliated corporation. The findings were not in evidence, though much of the testimony and exhibits on which they rested had been received by stipulation for certain limited purposes, and mainly to discover whether the prices paid to the affiliate were swollen beyond reason.* Cf. *Dayton*

*The stipulation states that the testimony and exhibits "shall, however, be considered upon four issues involved in this cause and four only, viz:

"1. The earnings of the Western Electric and the reasonableness of such earnings.

Power & Light Co. v. *Public Utilities Commission of Ohio*, 292 U. S. 290, 295. The Commission consulted these findings as indicative of market trends and leaned upon them heavily. By resort to these and cognate sources, the value at the beginning of 1926 was fixed at 98.73% of the value at the date certain; the 1927 value at 95.7%; the 1928 value at 95%; the 1929 value at 96.3%; the 1930 value at 92.2%; the 1931 value at 86.6%; the 1932 value at 76.8%; the 1933 value at 79.1%. Upon that basis the company was found to have been in receipt of excess earnings of $13,289,172, distributed as follows: for 1925, $1,822,647; for 1926, $2,041,483; for 1927, $1,986,610; for 1928, $1,925,301; for 1929, $1,4[illegible],347; for 1930, $1,481,689; for 1931, $1,652,760; for 1932, $908,335; for 1933, nothing. The excess was arrived at by figuring a return of 7% upon the value as a reasonable rate for the years 1925 to 1929, inclusive; 6.5% for the years 1930 and 1931; and 5.5% for the years 1932 and 1933. There being no excess revenue for the year 1933, the last year covered by the report, the Commission did not fix any percentage of reduction for the rates in future years. It did, however, prescribe a refund of the full amount of the excess for the years in which excess earnings were found to have been realized. The state-wide proceeding to fix rates for the future on the basis of a date certain was thus transformed finally into a refund proceeding, similar in function to proceedings under the Pence law for the refund of charges collected under bonds. The report of the Commission determining the excess was signed by a majority of the members, the Chairman dissenting. It was accompanied by an order similar in tenor.

The company protested and moved for a rehearing. In its protest it stated that the trend percentage accepted in the findings as marking a decline in values did not come from any official sources which the Commission had the right to notice judicially; that they had not been introduced in evidence; that the company had not been given an opportunity to explain or rebut them; and that by their use the Commission had denied a fair hearing in contravention of

"2. The cost to the American Telephone and Telegraph Company of rendering services under the license contract and the reasonable amount which should be allocated in that respect to The Ohio Bell Telephone Company.

"3. The separation and apportionment of the property, revenues and expenses of The Ohio Bell Telephone Company as between its intrastate and interstate property, revenues and expenses.

"4. Rate of return."

the requirements of the Fourteenth Amendment. Demand was made that an opportunity be conceded for explanation and rebuttal; demand was made also that the company be permitted to submit evidence showing separately for each year the fair value of its property, its revenues, expenses and net income in each of the several cases wherein rates had been collected under bond. This last was a renewal of a demand which had been made several times in the course of the inquiry, as the Commission in its report concedes. By order dated March 1, 1934, the protests were overruled, and the demands rejected. By order dated July 5 of the same year the Commission modified to some extent its findings as to the excess income referable to bonded rates, and directed the company to show cause why refunds of the excess should not be made upon that basis. Again there was protest with a renewal of the request that evidence be received along the lines already indicated. Again the Commission reaffirmed its previous position.

The outcome of these manoeuvres was the filing of a final order, dated September 6, 1934, apportioning the excess income between bonded and non-bonded rates by allocating to the former class a total of $11,423,137 for exchange subscribers and $409,127 for toll patrons (in all $11,832,264) and directing payment accordingly. Distribution was to be made among the several exchanges upon the basis of the percentage relation of the gross exchange revenues in the exchanges where bonds were in effect to the total gross exchange revenues, bonded and unbonded. If even a single rate in a particular exchange, e.g., in the city of Cleveland, had been collected under bond, all the revenues of that exchange were included in reckoning the percentage of the total that should go to the Cleveland customers. So much of the excess as was not used up in that way was apportioned to the tolls. This method of allocation was made the subject of another protest, the company insisting that it was arbitrary and unequal and a denial of due process. Petitions in error were filed with the Supreme Court of Ohio in accordance with the state practice (General Code, § 544 *et seq.*) to review the final order of September 6, 1934, and the several intermediate orders supporting it. There was timely and adequate assertion of the infringement of the petitioner's rights under the Fourteenth Amendment. The Supreme Court of Ohio affirmed with an opinion per curiam. 131 Ohio St. 539. The case is here upon appeal. Judicial Code, § 237, 28 U. S. C. § 344.

First: The fundamentals of a trial were denied to the appellant when rates previously collected were ordered to be refunded upon the strength of evidential facts not spread upon the record.

The Commission had given notice that the value of the property would be fixed as of a date certain. Evidence directed to the value at that time had been laid before the triers of the facts in thousands of printed pages. To make the picture more complete, evidence had been given as to the value at cost of additions and retirements. Without warning or even the hint of warning that the case would be considered or determined upon any other basis than the evidence submitted, the Commission cut down the values for the years after the date certain upon the strength of information secretly collected and never yet disclosed: The company protested. It asked disclosure of the documents indicative of price trends, and an opportunity to examine them, to analyze them, to explain and to rebut them. The response was a curt refusal. Upon the strength of these unknown documents refunds have been ordered for sums mounting into millions, the Commission reporting its conclusion, but not the underlying proofs. The putative debtor does not know the proofs today. This is not the fair hearing essential to due process. It is condemnation without trial.

An attempt was made by the Commission and again by the state court to uphold this decision without evidence as an instance of judicial notice. Indeed, decisions of this court were cited (*Atchison, Topeka & Santa Fe Ry. Co.* v. *United States*, 284 U. S. 248, 260; *Dayton Power & Light Co.* v. *Public Utilities Commission of Ohio*, supra, p. 311; *Central Kentucky Natural Gas Co.* v. *Railroad Commission of Kentucky*, 290 U. S. 264, 274, 275) as giving support to the new doctrine that the values of land and labor and buildings and equipment, with all their yearly fluctuations, no longer call for evidence. Our opinions have been much misread if they have been thought to point that way. Courts take judicial notice of matters of common knowledge. 5 Wigmore, Evidence, §§ 2571, 2580, 2583; Thayer, Preliminary Treatise on Evidence, pp. 277, 302. They take judicial notice that there has been a depression, and that a decline of market values is one of its concomitants. *Atchison, Topeka & Santa Fe Ry. Co.* v. *United States*, supra; *Dayton Power & Light Co.* v. *Public Utilities Commission of Ohio*, supra; *Central Kentucky Natural Gas Co.* v. *Railroad Commission of Kentucky*, supra.

How great the decline has been for this industry or that, for one material or another, in this year or the next, can be known only to the experts, who may even differ among themselves. For illustration, a court takes judicial notice of the fact that Confederate money depreciated in value during the war between the states (*Wood* v. *Cooper*, 2 Heisk. (Tenn.) 441, 447; *Hix* v. *Hix*, 25 W. Va. 481, 484, 485), but not of the extent of the depreciation at a given time and place. *Modawell* v. *Holmes*, 40 Ala. 391, 405. Cf. *Feemster* v. *Ringo*, 5 T. B. Munroe (Ky.) 336, 337; *Baxter* v. *McDonnell*, 155 N. Y. 83, 93. The distinction is the more important in cases where as here the extent of the fluctuations is not collaterally involved but is the very point in issue. Moreover, notice, even when taken, has no other effect than to relieve one of the parties to a controversy of the burden of resorting to the usual forms of evidence. Wigmore, Evidence, § 2567; 1 Greenleaf, Evidence, 16th ed., p. 18. "It does not mean that the opponent is prevented from disputing the matter by evidence if he believes it disputable." *Ibid.* Cf. *Shapleigh* v. *Mier*, Jan. 4, 1937, — U. S. —. Such at least is the general rule, to be adhered to in the absence of exceptional conditions. Here the contention would be futile that the precise amount of the decline in values was so determinate or notorious in each and every year between 1925 and 1933 as to be beyond the range of question. So much is indeed conceded on the face of the report itself. No rational concept of notoriety will include these variable elements. True, the category is not a closed one. "The precedents of former judges, in declining to notice or assenting to notice specific facts, do not restrict the present judge from noticing a new fact, provided only that the new fact *is* notorious to the community." 5 Wigmore, Evidence, § 2583. Even so, to press the doctrine of judicial notice to the extent attempted in this case and to do that retroactively after the case had been submitted, would be to turn the doctrine into a pretext for dispensing with a trial.

What was done by the Commission is subject, however, to an objection even deeper. Cf. *Brown* v. *New Jersey*, 175 U. S. 172, 174, 175; *West* v. *Louisiana*, 194 U. S. 258, 262, 263. There has been more than an expansion of the concept of notoriety beyond reasonable limits. From the standpoint of due process—the protection of the individual against arbitrary action—a deeper vice is this, that even now we do not know the particular or evidential facts of

which the Commission took judicial notice and on which it rested its conclusion. Not only are the facts unknown; there is no way to find them out. When price lists or trade journals or even government reports are put in evidence upon a trial, the party against whom they are offered may see the evidence or hear it and parry its effect. Even if they are copied in the findings without preliminary proof, there is at least an opportunity in connection with a judicial review of the decision to challenge the deductions made from them. The opportunity is excluded here. The Commission, withholding from the record the evidential facts that it has gathered here and there, contents itself with saying that in gathering them it went to journals and tax lists, as if a judge were to tell us, "I looked at the statistics in the Library of Congress, and they teach me thus and so." This will never do if hearings and appeals are to be more than empty forms.

We have pointed out elsewhere that under the statutes of Ohio no provision is made for a review of the order of the Commission by a separate or independent suit. *West Ohio Gas Co.* v. *Public Utilities Commission (No. 1)*, 294 U. S. 63, 68. A different question would be here if such a suit could be maintained with an intermediate suspension of the administrative ruling. *Porter* v. *Investors Syndicate*, 286 U. S. 461, 470, 471; *United States* v. *Illinois Central R. R. Co.*, 291 U. S. 457, 463; *Nickey* v. *Mississippi*, 292 U. S. 393, 396; *Wells, Fargo & Co.* v. *Nevada*, 248 U. S. 165, 168. Cf. *Norwegian Nitrogen Co.* v. *United States*, 288 U. S. 294, 318, 319. In Ohio the sole method of review is by petition in error to the Supreme Court of the State, which considers both the law and the facts upon the record made below, and not upon new evidence. In such circumstances judicial review would be no longer a reality if the practice followed in this case were to receive the stamp of regularity. To put the problem more concretely: how was it possible for the appellate court to review the law and the facts and intelligently decide that the findings of the Commission were supported by the evidence when the evidence that it approved was unknown and unknowable? In expressing that approval the court did not mean that traveling beyond the record, it had consulted price lists for itself and had reached its own conclusion as to the percentage of decline in value from 1925 onwards. It did not even mean that it had looked at the particular lists made use of by the Commission, for no one knows

what they were in any precise or certain way. Nowhere in the opinion is there even the hint of such a search. What the Supreme Court of Ohio did was to take the word of the Commission as to the outcome of a secret investigation, and let it go at that. "A hearing is not judicial, at least in any adequate sense, unless the evidence can be known." *West Ohio Gas. Co.* v. *Public Utilities Commission (No. 1)* supra, p. 69. Cf. *Interstate Commerce Commission* v. *Louisville & N. Ry. Co.*, 227 U. S. 88, 91; *United States* v. *Abilene & Southern Ry. Co.*, 265 U. S. 274, 288; *The Chicago Junction Case*, 264 U. S. 258, 263, 264, 265.

Regulatory commissions have been invested with broad powers within the sphere of duty assigned to them by law. Even in quasi-judicial proceedings their informed and expert judgment exacts and receives a proper deference from courts when it has been reached with due submission to constitutional restraints. *West Ohio Gas Co.* v. *Public Utilities Commission (No. 1)*, supra, p. 70; *West Ohio Gas Co.* v. *Public Utilities Commission (No. 2)*, 294 U. S. 79; *Los Angeles Gas & Electric Corp.* v. *Railroad Commission of California*, 289 U. S. 287, 304. Indeed, much that they do within the realm of administrative discretion is exempt from supervision if those restraints have been obeyed. All the more insistent is the need, when power has been bestowed so freely, that the "inexorable safeguard" (*St. Joseph Stock Yards Co.* v. *United States*, 298 U. S. 38, 73) of a fair and open hearing be maintained in its integrity. *Morgan* v. *United States*, 298 U. S. 468, 480, 481; *Interstate Commerce Commission* v. *Louisville & N. Ry. Co.*, supra. The right to such a hearing is one of "the rudiments of fair play" (*Chicago, M. & St. P. Ry. Co.* v. *Polt*, 232 U. S. 165, 168) assured to every litigant by the Fourteenth Amendment as a minimal requirement. *West Ohio Gas Co.* v. *Public Utilities Commission (No. 1)*, *(No. 2)*, supra; *Brinkerhoff-Faris Co.* v. *Hill*, 281 U. S. 673, 682. Cf. *Norwegian Nitrogen Co.* v. *United States*, supra. There can be no compromise on the footing of convenience or expediency, or because of a natural desire to be rid of harassing delay, when that minimal requirement has been neglected or ignored.

In an endeavor to sustain the judgment the state shifts its line of argument from the course pursued below, so far, at least, as the course then followed is reflected in the record. Both the Commission and the Supreme Court of Ohio tell us that they have applied

the price trends to the value on the day certain by resort to judicial notice. The state now suggests that whatever the court or the Commission may have professed to be doing, there was a basis in the evidence for the conclusion ultimately reached. To give aid to that suggestion reference is made to the findings of a federal court as to the prices charged by Western Electric for telephone equipment, which findings were not in evidence, though they were founded upon evidence received by stipulation for purposes narrowly defined and exclusive of any others. The terms of the stipulation have already been stated in this opinion. Even if we assume in favor of the state that the evidence, when in, could be considered as indicative of the trend of market values generally, the judgment is not helped. The Commission did not take the prices paid by appellant to the affiliated corporation as the only evidence of market trends, but merely as one factor along with many others. What weighting it gave them the record does not disclose, and the Commission denied the appellant an opportunity to inquire. According to appellant's computation, telephone apparatus and equipment make up less than 30% of the value of appellant's plant. Even for that portion of the plant, the Western Electric prices were not accepted as decisive, but were supplemented and corrected from sources *dehors* the record. For the other 70%, they were without probative significance, at all events until supplemented by evidence that the decline in the value of apparatus and equipment was less than that in the value of land or buildings or other components of the plant. To fix the value of these components the Commission had recourse to statistics which it collected for itself. "There was no suitable opportunity through evidence and argument . . . to challenge the result". *West Ohio Gas Co.* v. *Public Utilities Commission (No. 1)*, *supra*, p. 90.

Second: The appellant has not estopped itself from objecting to the use of price trends gathered in its absence.

The company did not oppose the consolidation of the state-wide investigation with the Pence law proceedings. This did not amount, however, to a waiver of its right to have the value of its property determined upon evidence. At no stage of the inquiry was there any suggestion by the Commission that a different course would be pursued. We have no need to consider how the separate proceedings would have been affected by a valuation of the property in the general investigation if the evidence of value had been gathered

in the usual way. In the thought of the state such a course would have obviated the necessity for separate evidence of value as to the exchanges under bond, but the company contended otherwise and made offers of proof in support of its contention. The merits of the opposing views in that regard may be put aside as irrelevant upon the record now before us. What is certain in any event is this, that nothing in the course of the trial gave warning of the purpose of the Commission, while rejecting evidence of value in respect of exchanges under bond, to wander afield and fix the composite value of the system without reference to any evidence, upon proofs drawn from the clouds. As there was no warning of such a course, so also there was no consent to it. We do not presume acquiescence in the loss of fundamental rights.

Third: The allocation of excess income among the subscribers to exchanges and also among toll patrons is challenged by the appellant, the state retorting with the contention that there has been no denial of due process in the manner of partition, whatever may be said as to the possibility of inaccuracy or error.

We find it unnecessary at this time to choose between these two contentions. A court is not required to define the proper method of allocation until there has been a proper ascertainment of the thing to be allocated. When that has been done, there may be agreement or acquiescence in respect of the manner of division. Moreover, upon another hearing the problem may be eliminated if value, revenues and expenses are proved for each exchange.

Fourth: The same reasons that make it unnecessary to fix the method of allocation relieve us of the duty of passing upon other problems, such as those of going concern value and depreciation reserve, which cannot be disposed of adequately until the value of the physical plant has first been ascertained.

The decree is reversed and the cause remanded for further proceedings not inconsistent with this opinion.

Ordered accordingly.

A true copy.

Test:

Clerk, Supreme Court, U. S.